OSHA

U.S. Department of Labor
Occupational Safety and Health Administration
Directorate of Training and Education
OSHA Training Institute
2020 South Arlington Heights Road
Arlington Heights, IL 60005
1-847-759-7770

COURSE TITLE:	**ACCIDENT INVESTIGATION**
COURSE NUMBER:	**1230**
CONTINUING EDUCATION UNITS (CEUs):	**3.5**
CONTACT HOURS:	**18 HOURS**
SCHEDULE ID:	**924870**
DURATION:	**03/01/2017 - 03/03/2017**
TRAINING LOCATION:	**10946 Golden West Drive, Suite 160 Hunt Valley, MD 21031**
GENERAL INFORMATION:	**(410) 527-2087**
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Director, OSHA Training Institute	Anthony M. Towey
Director, Office of Occupational Safety Training	Joseph R. Zawacki, MBA
Director, Office of Construction Safety Training	Ken Koroll, MS, CSP, CHST
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Director, Office of Education & Training Dev.	Linda Spurling-Krug, CIH
Course Material Developer	Kevin Vojtech, MS, CIH
Course Chairperson	Tom Wirgau
Instructional Staff	Peter Kleczynski Eric Reinhardt Tom Wirgau

OSHA Training Institute Course #1230: Accident Investigation
Course Chair: Tom Wirgau ~ March 01, 2017 - March 03, 2017

Time	Section	Title	Instructor(s)
		Wednesday, March 01, 2017	
8:00 - 9:15	INTRO	Course Opening / Pretest	Wirgau
9:30 - 10:00	LO1	OSHA Requirements	Wirgau
10:15- 11:30	LO1 - Practice	Writing an Abstract - WORKSHOP	Wirgau
11:30 - 12:30		**LUNCH**	
12:30 - 1:30	LO2	On-Site Investigation / Physical Evidence	Reinhardt
1:45 - 2:45	LO2	Determining the Process / Preserving the Incident Scene	Reinhardt
3:00 - 4:15	LO2	Documenting the Investigation	Reinhardt
Thursday, March 02, 2017			
8:00 - 8:15		Previous Day Review	Wirgau
8:15 - 9:00	LO2-Practice	On-Site Documenting the Scene - Workshop	Wirgau
9:15 - 10:15	LO2	De-escalating of Stressful Situations	Kleczynski
10:30 - 11:30	LO3	Root Cause Analysis / Causal Factor Analysis	Kleczynski
11:30 - 12:30		**LUNCH**	
12:30 - 1:30	LO3 - Practice	Formosa CSB Video - Workshop	Wirgau
1:45 - 2:45	LO3	Fault Tree Analysis	Kleczynski
3:00 - 3:45	LO3 - Practice	Fault Tree Analysis - Workshop	Kleczynski/Wirgau
3:45 - 4:15	LO3	Documenting an Incident Case File & Legal Sufficiency	Kleczynski
Friday, March 03, 2017			
8:00 - 8:15		Previous Day Review	Wirgau
8:15 - 9:00	LO3 - Practice	Construction Crane Collapse - Final Workshop	Wirgau
9:15 - 10:15	LO3 - Practice	Construction Crane Collapse - Final Workshop	Wirgau
10:30 - 11:30	LO3 - Practice	Construction Crane Collapse - Final Workshop	Wirgau
11:30 - 12:30		**LUNCH**	
12:30 - 1:30	LO3 - Practice	Construction Crane Collapse - Final Workshop	Wirgau
1:45 - 2:30	LO3 - Practice	Construction Crane Collapse - Final Workshop	Wirgau
2:45 - 4:15		Post-Test; Course Evaluation; Closing	Wirgau

Back on the Job…

My Top 3 action items are:

1.

2.

3.

I will be able to implement these action items back on the job if I:

Possible obstacles I might face in implementing my action items are:

I can overcome these obstacles by:

Course # ______________________________

Course Name: _________________________

Name: ____________________________'s

Training Action Plan

Your Action Plan is an important tool that will help you use what you've learned back on the job.

- Keep it open and nearby.
- Take action-oriented notes about what you're learning and what you'll apply back at work.

When you return to work, review this action plan with your supervisor and discuss what, when, and how you will begin to implement what you learned in this course.

OSHA® Occupational Safety and Health Administration

New Knowledge/Skills Learned in this Course

Ideas on How to Make the Learning Work at Work

October 2016

MEMORANDUM FOR: STUDENTS & VISITORS OF DTE/OTI

SUBJECT: RULES & REGULATIONS

1. **EMERGENCY PLAN:** ALL STUDENTS & VISITORS are required to sign in at the guard station or in the classroom on a daily basis. The sign in sheets are used to account for personnel in the event of an emergency.

    a. **FIRE EVACUATION** = If the alarm is sounded and an announcement directs an evacuation, please exit the building at the nearest exit. Two stair wells are available for egress, one at the west end and one at the east end of the building. Please meet your instructor or designated OTI staff in the southwest parking lot near the gazebo. Identify your assigned classroom and gather in the parking space with the corresponding number. Do not block any emergency routes at any time.

    b. **SHELTER-IN-PLACE** = If the alarm sounds and an announcement directs a shelter-in-place, please enter the nearest stairwell. Identify the section of the stairwell bearing the number of your assigned classroom and await your instructor at that location. Remain there until you are released to return to your classroom or evacuate.

    ACTIVE SHOOTER = If an announcement informs you there is an active shooter in the building, please evacuate through the nearest exit. Continue north (away from the Dunkin Donuts and toward Walgreens) along Arlington Heights Road to the fire station, two buildings away. Meet your instructor or designated OTI staff in the back parking lot of the fire department.

2. **PROFESSIONAL CONDUCT:** Unacceptable conduct will not be tolerated. Students will be withdrawn from class and returned to their office. Course credit will not be provided. Student's Supervisors will be contacted.

3. **SAFETY and HEALTH PROGAM:** DTE/OTI follows the OSHA Field Safety and Health Manual. Students must follow instructions regarding safe use of equipment, personal protection, and behavior. Students and visitors must stay clear of any area where contractors are performing work.

4. **CELL PHONES, LAPTOPS, & DEVICES:** All electronic devices must be turned off or placed in silent mode during course instruction. If you must be available by phone for an unusual circumstance, please notify the course chairperson. Laptops may be used for class activities at the discretion of the chairperson/instructor.

5. **FULL ATTENDANCE:** You are required to attend the entire course. The final test will be administered on the last day of class, followed by distribution of course certificates. In an emergency, if you must be absent, the course chairperson and your supervisor must be informed as soon as possible. You will not be awarded a certificate of completion if you fail to attend the entire course.

6. **SECURITY BADGES:** Badges must be worn at all times. Students and visitors must enter and exit the facility through the front lobby only.

7. **RESTRICTED AREAS:** Student access to the 3rd floor, labs, duplication office and dock area is prohibited unless accompanied by OTI staff. Visitors must be escorted by DTE staff.

8. **ATTIRE:** Casual attire is acceptable while attending courses. Shorts are prohibited. Proper footwear is required; sandals are prohibited during course laboratories and equipment demonstrations.

9. **SHIPMENT of COURSE MATERIALS:** Shipping materials are available on the second floor. Participants must use the service account authorized by their office. The OTI address is not authorized for use by students or visitors. There will be a cart in the hall on the second floor or in the classroom for sealed and labeled boxes. You must use your official office address only. Do not leave any parcels in the front lobby.

10. **PERSONAL ITEMS:** Items such as, but not limited to purses, glasses, electronic devices and jackets are the sole responsibility of the owner.

11. **FOOD and BEVERAGES:** Consumption of food or beverages is allowed in the classroom. Students should clean their respective area and dispose of all waste before exiting the premises each day. DTE maintains a recycling program. Paper recycling containers are located in your classroom and containers for mixed items, glass, plastic and aluminum, are located in the hallway next to the restroom doors.

12. **PARKING:** Parking is restricted to DTE facility parking lot. Cars parked at other locations may be ticketed and/or towed at the owner's expense.

13. **LUGGAGE:** Do not leave any luggage or parcels in the front lobby. Keep all luggage in your control while in the building.

14. **SMOKING:** Smoking and vaping is prohibited inside any federal building. Designated smoking areas are provided on either side of the front, main entrance. Receptacles are provided for disposal.

15. **NONENDORSEMENT OF COMMERCIAL INTERESTS:** The OSHA Training Institute uses outside contractors from private consulting firms, technical equipment manufacturers and safety supply firms for demonstration purposes only. These external entities may have proprietary interests. OTI does not promote or endorse any individual or product.

16. **COPYRIGHTED MATERIALS:** Various materials presented and used for the purpose of delivery and understanding of course content are solely granted to the OSHA Training Institute. Students may not reproduce, distribute, display, or make derivative works without approval from the original author/creator.

17. **STUDENT TRANSCRIPTS and RECORDS:** Students may access their OTI course record through LearningLink history. Those without LearningLink access must submit a transcript request to oti.registration@dol.gov

18. **INTERNET & WIFI:** Computers are available as a courtesy on the second floor. Log out of any official and personal websites and browsers when you complete your session. These computers are maintained for use during breaks. **WIFI may only be used for training purposes during regular class hours. It is prohibited to surf on unprofessional websites with the use of the DTE WIFI. Video downloading should only be performed during lunch hours. The user must abide by copyright laws when transferring video content.**

19. **EXITING THE BUILDING: When leaving the building, PLEASE be careful and look BOTH directions for moving vehicles. There have been some near misses.**

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210

Reply to the attention of:

Dear Safety and Health Professional,

Thank you in advance for your active participation in the course you are about to begin at the OSHA Training Institute (OTI). I am convinced that well trained, professional, and dedicated OSHA employees and other safety and health professionals are essential for fulfilling the intent of the Occupational Safety and Health Act: To assure safe and healthful working conditions for working men and women. I hope and expect you will take the information you receive during this course back to your work and use it to further the Agency's critical mission.

To be effective, OSHA employees, Federal and State Compliance Officers, OSHA consultants, and other Federal Agency and private sector personnel need broad knowledge of workplace hazards and expertise in identifying and controlling them. Acquiring this knowledge and expertise is a formidable undertaking given the vast array of hazards that exist in US workplaces. OTI courses offer the technical information and perspective to help develop your skills. Your success in completing this course is no longer measured by merely being present when the information is discussed or completing the course objectives. Your success, like the success of the course, is realized when the knowledge and skills gained are used in your daily work protecting American workers.

The Labor Department has a long history of contributing to the welfare of American workers. Frances Perkins, the fourth Secretary of Labor, once stated:

"There is always a large horizon…. There is much to be done … I am not going to be doing it! It is up to you to contribute some small part to a program of human betterment for all time."

Your participation in this course is evidence of your commitment to striving for Secretary Perkin's large horizon, and I thank you for it. I trust you will find your learning experience rewarding and wish you every success in the future.

Sincerely,

Dorothy Dougherty

Dorothy Dougherty,
Deputy Assistant Secretary

Participant Guide: 1230 Incident [Accident] Investigation

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- Causal Factor Analysis
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- Fault Tree Analysis
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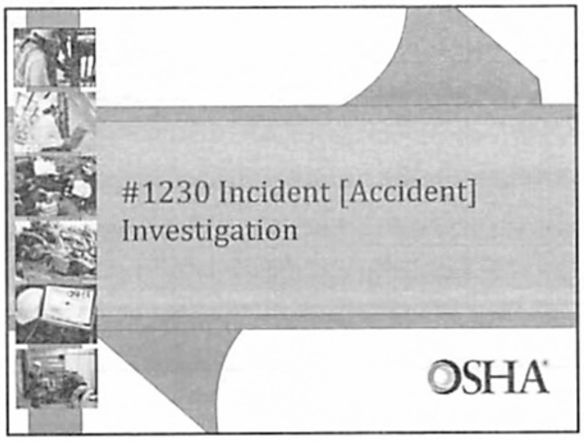
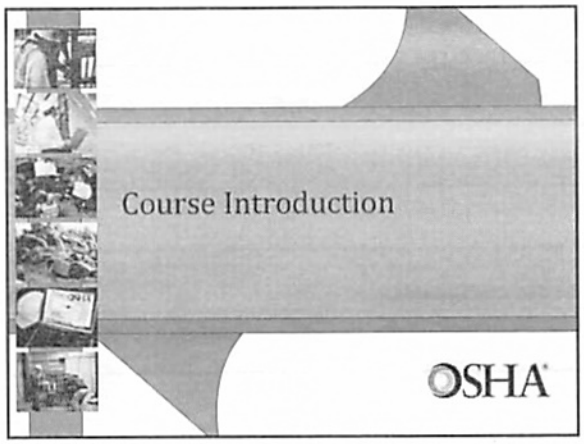
- Investigating Accidents in the Workplace
- OSHA's Policy for Protecting Federal OSHA Personnel From blood borne Pathogens and Other Potentially Infectious Materials
- Protect Yourself Against Blood borne Pathogens
- Glossary



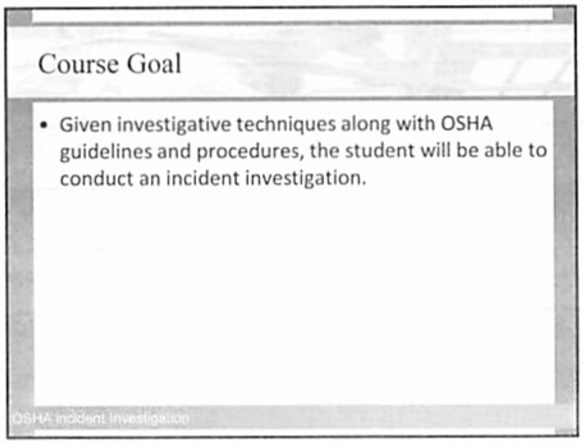
#1230 Incident [Accident] Investigation

OSHA



Course Introduction

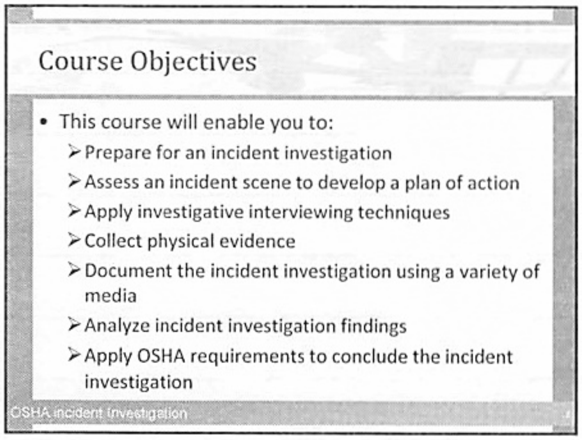
OSHA



Course Goal

- Given investigative techniques along with OSHA guidelines and procedures, the student will be able to conduct an incident investigation.

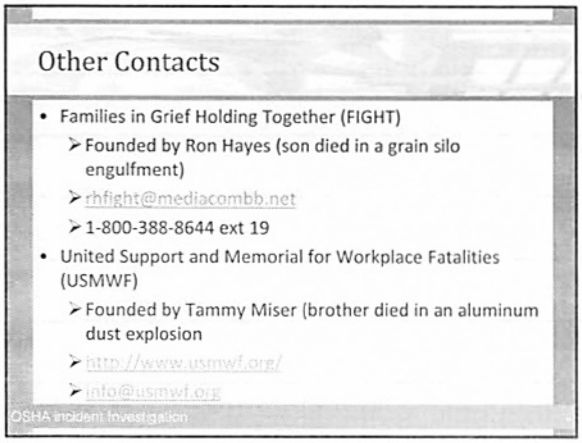
OSHA Incident Investigation



Course Objectives

- This course will enable you to:
  - Prepare for an incident investigation
  - Assess an incident scene to develop a plan of action
  - Apply investigative interviewing techniques
  - Collect physical evidence
  - Document the incident investigation using a variety of media
  - Analyze incident investigation findings
  - Apply OSHA requirements to conclude the incident investigation

Article Link: A Grave Mistake



Other Contacts

- Families in Grief Holding Together (FIGHT)
  - Founded by Ron Hayes (son died in a grain silo engulfment)
  - rhfight@mediacombb.net
  - 1-800-388-8644 ext 19
- United Support and Memorial for Workplace Fatalities (USMWF)
  - Founded by Tammy Miser (brother died in an aluminum dust explosion
  - http://www.usmwf.org/
  - info@usmwf.org

CPL 02-00-153

Communicating OSHA Fatality Inspection Procedures to a Victim's Family

Purpose:

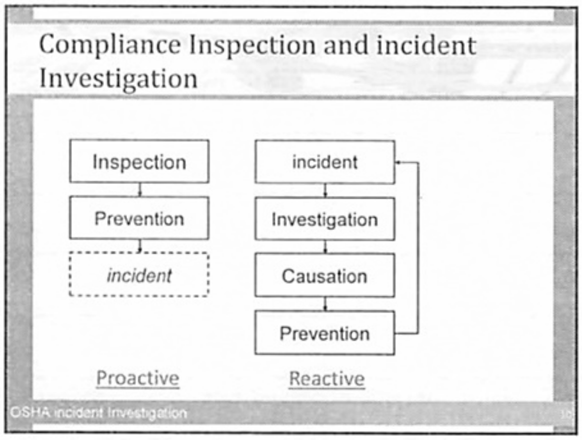
This Instruction provides guidance to ensure the Occupational Safety and Health Administration (OSHA) communicates its fatality inspection procedures to the victim's family and facilitates the exchange of information throughout the inspection and settlement process.

Compliance Inspection

- What happened?
- Where did it happen?
- When did it happen?
- Who was involved?
- What OSHA standards were violated?
- How can it be abated?

Incident Investigation

- What happened?
- Where did it happen?
- When did it happen?
- Who was involved?
- What OSHA standards were violated?
- Why did it happen?
- What is the root cause?
- How can it be abated?



Compliance Inspection and incident Investigation

Inspection

Prevention

incident

Proactive

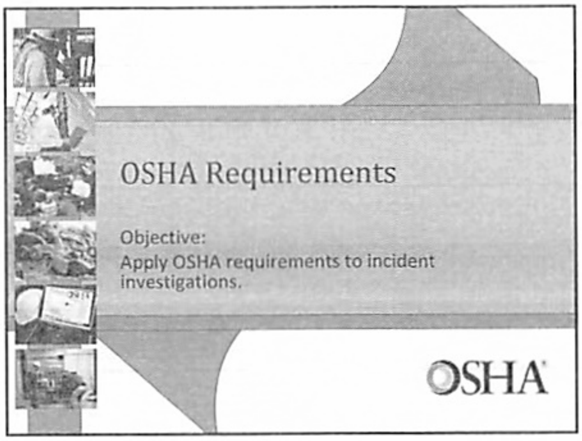
incident

Investigation

Causation

Prevention

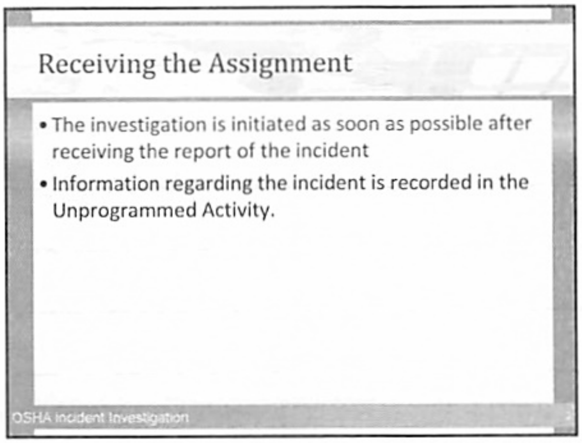
Reactive



OSHA Requirements

Objective:
Apply OSHA requirements to incident investigations.

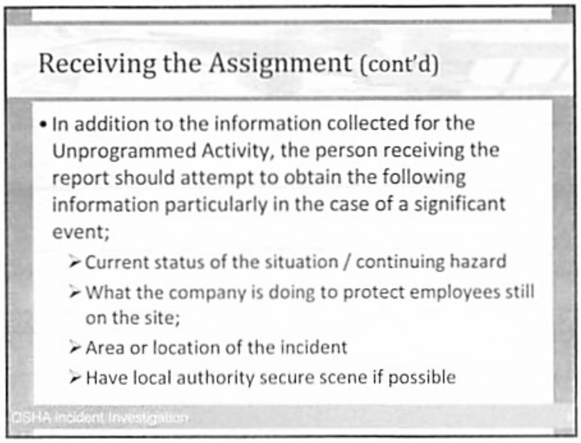
OSHA



Receiving the Assignment

- The investigation is initiated as soon as possible after receiving the report of the incident
- Information regarding the incident is recorded in the Unprogrammed Activity.

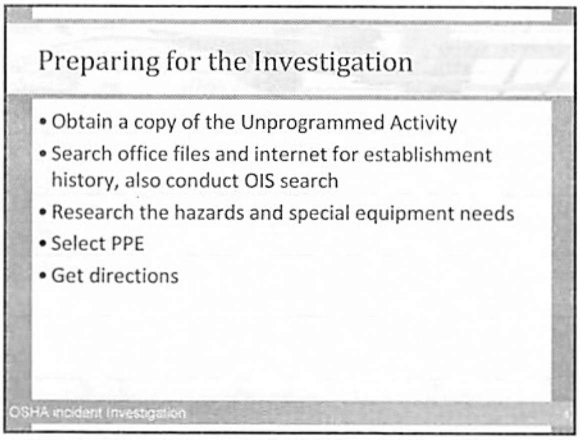
OSHA Incident Investigation



Receiving the Assignment (cont'd)

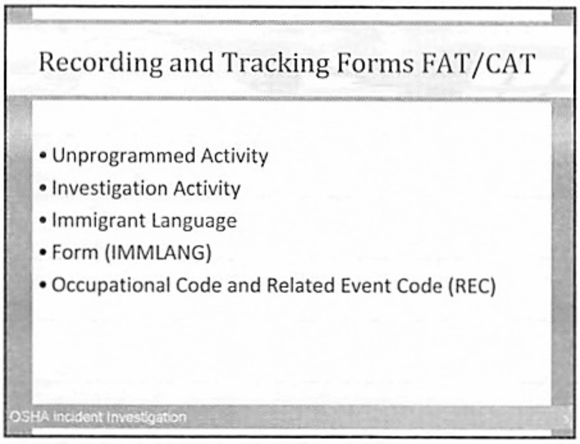
- In addition to the information collected for the Unprogrammed Activity, the person receiving the report should attempt to obtain the following information particularly in the case of a significant event;
  - Current status of the situation / continuing hazard
  - What the company is doing to protect employees still on the site;
  - Area or location of the incident
  - Have local authority secure scene if possible

OSHA Incident Investigation



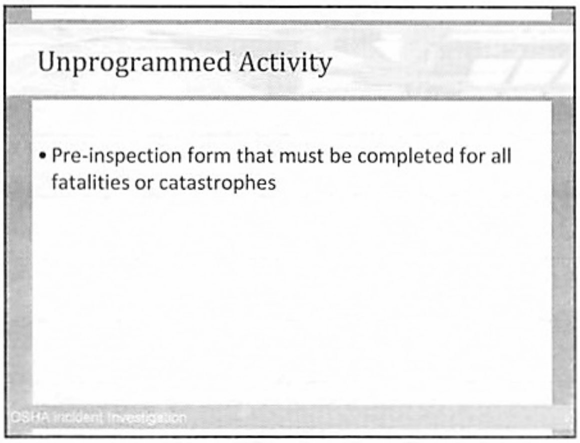
Preparing for the Investigation

- Obtain a copy of the Unprogrammed Activity
- Search office files and internet for establishment history, also conduct OIS search
- Research the hazards and special equipment needs
- Select PPE
- Get directions



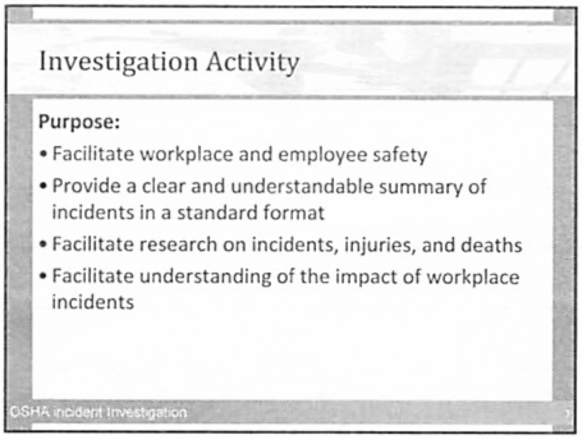
Recording and Tracking Forms FAT/CAT

- Unprogrammed Activity
- Investigation Activity
- Immigrant Language
- Form (IMMLANG)
- Occupational Code and Related Event Code (REC)



Unprogrammed Activity

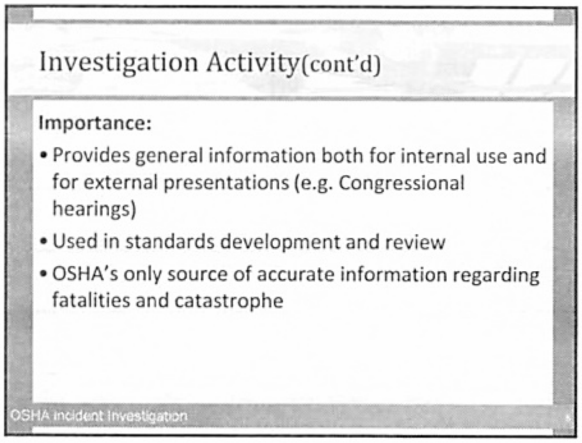
- Pre-inspection form that must be completed for all fatalities or catastrophes



Investigation Activity

Purpose:

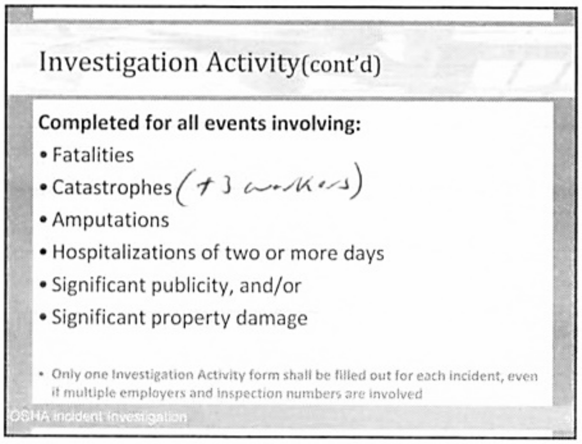
- Facilitate workplace and employee safety
- Provide a clear and understandable summary of incidents in a standard format
- Facilitate research on incidents, injuries, and deaths
- Facilitate understanding of the impact of workplace incidents



Investigation Activity(cont'd)

Importance:

- Provides general information both for internal use and for external presentations (e.g. Congressional hearings)
- Used in standards development and review
- OSHA's only source of accurate information regarding fatalities and catastrophe

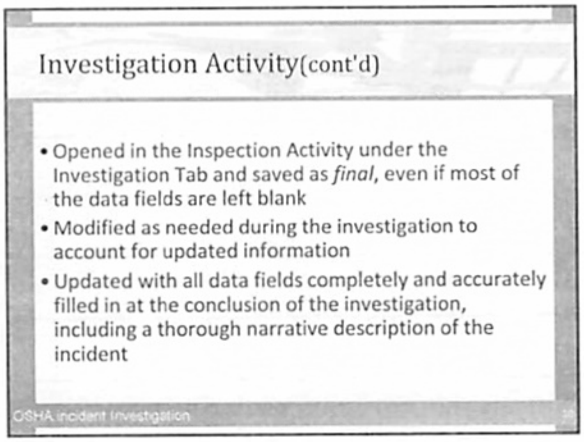


Investigation Activity(cont'd)

Completed for all events involving:

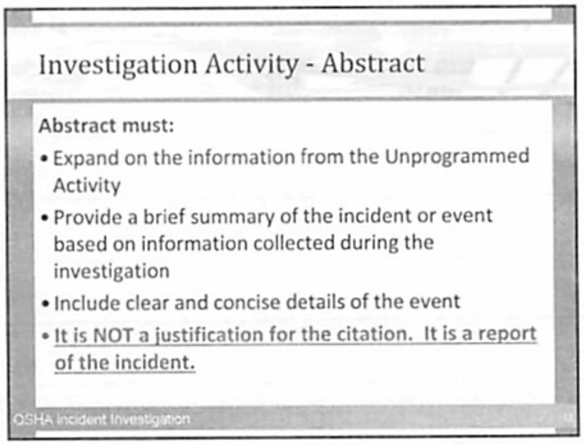
- Fatalities
- Catastrophes (+3 workers)
- Amputations
- Hospitalizations of two or more days
- Significant publicity, and/or
- Significant property damage

- Only one Investigation Activity form shall be filled out for each incident, even if multiple employers and inspection numbers are involved



Investigation Activity(cont'd)

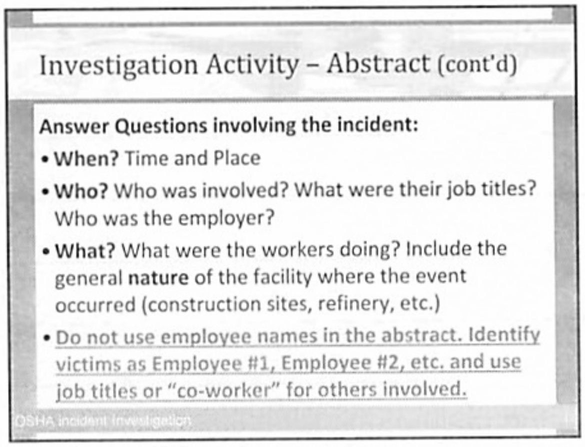
- Opened in the Inspection Activity under the Investigation Tab and saved as *final*, even if most of the data fields are left blank
- Modified as needed during the investigation to account for updated information
- Updated with all data fields completely and accurately filled in at the conclusion of the investigation, including a thorough narrative description of the incident



Investigation Activity - Abstract

Abstract must:

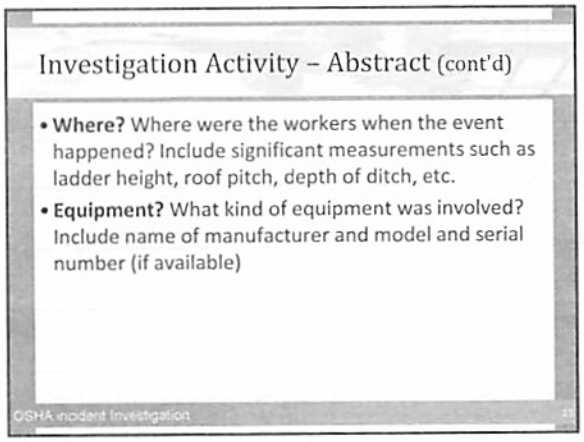
- Expand on the information from the Unprogrammed Activity
- Provide a brief summary of the incident or event based on information collected during the investigation
- Include clear and concise details of the event
- It is NOT a justification for the citation. It is a report of the incident.



Investigation Activity – Abstract (cont'd)

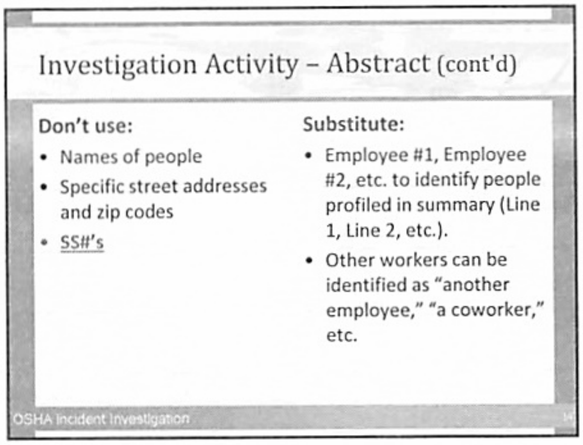
Answer Questions involving the incident:

- **When?** Time and Place
- **Who?** Who was involved? What were their job titles? Who was the employer?
- **What?** What were the workers doing? Include the general **nature** of the facility where the event occurred (construction sites, refinery, etc.)
- Do not use employee names in the abstract. Identify victims as Employee #1, Employee #2, etc. and use job titles or "co-worker" for others involved.



Investigation Activity – Abstract (cont'd)

- **Where?** Where were the workers when the event happened? Include significant measurements such as ladder height, roof pitch, depth of ditch, etc.
- **Equipment?** What kind of equipment was involved? Include name of manufacturer and model and serial number (if available)



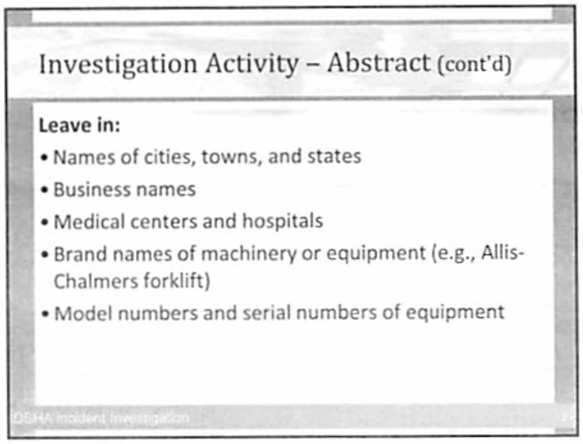
Investigation Activity – Abstract (cont'd)

Don't use:

- Names of people
- Specific street addresses and zip codes
- SS#'s

Substitute:

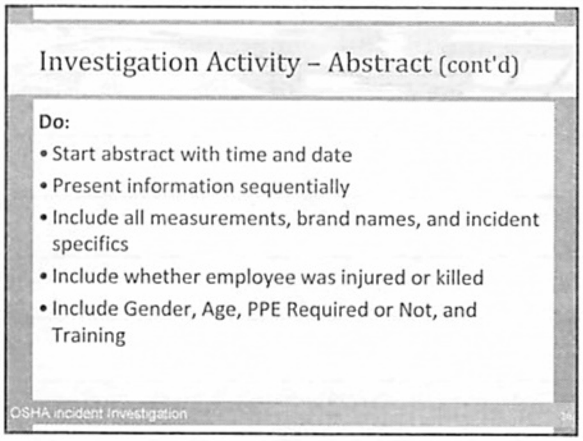
- Employee #1, Employee #2, etc. to identify people profiled in summary (Line 1, Line 2, etc.).
- Other workers can be identified as "another employee," "a coworker," etc.



Investigation Activity – Abstract (cont'd)

Leave in:

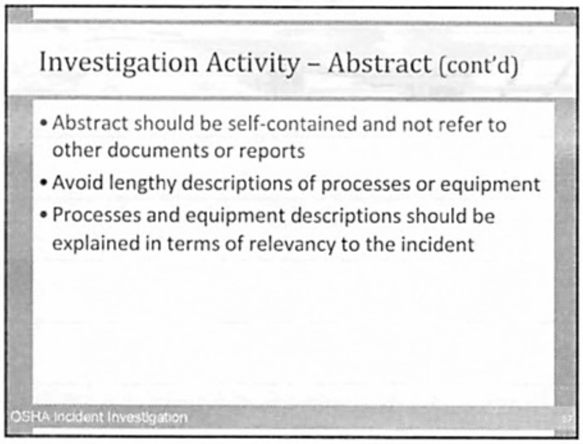
- Names of cities, towns, and states
- Business names
- Medical centers and hospitals
- Brand names of machinery or equipment (e.g., Allis-Chalmers forklift)
- Model numbers and serial numbers of equipment



Investigation Activity – Abstract (cont'd)

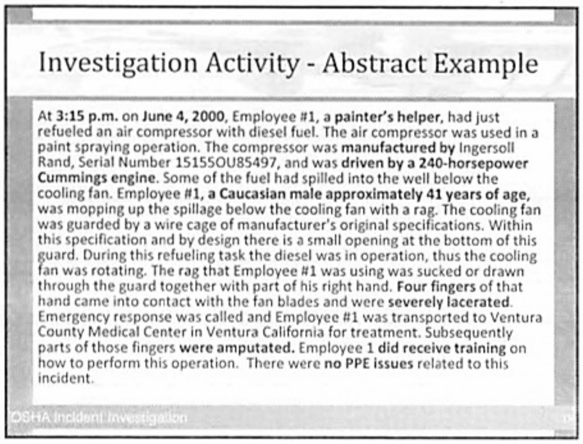
Do:

- Start abstract with time and date
- Present information sequentially
- Include all measurements, brand names, and incident specifics
- Include whether employee was injured or killed
- Include Gender, Age, PPE Required or Not, and Training



Investigation Activity – Abstract (cont'd)

- Abstract should be self-contained and not refer to other documents or reports
- Avoid lengthy descriptions of processes or equipment
- Processes and equipment descriptions should be explained in terms of relevancy to the incident



Investigation Activity - Abstract Example

At **3:15 p.m.** on **June 4, 2000**, Employee #1, **a painter's helper**, had just refueled an air compressor with diesel fuel. The air compressor was used in a paint spraying operation. The compressor was **manufactured by** Ingersoll Rand, Serial Number 15155OU85497, and was **driven by a 240-horsepower Cummings engine**. Some of the fuel had spilled into the well below the cooling fan. Employee #**1, a Caucasian male approximately 41 years of age,** was mopping up the spillage below the cooling fan with a rag. The cooling fan was guarded by a wire cage of manufacturer's original specifications. Within this specification and by design there is a small opening at the bottom of this guard. During this refueling task the diesel was in operation, thus the cooling fan was rotating. The rag that Employee #1 was using was sucked or drawn through the guard together with part of his right hand. **Four fingers** of that hand came into contact with the fan blades and were **severely lacerated**. Emergency response was called and Employee #1 was transported to Ventura County Medical Center in Ventura California for treatment. Subsequently parts of those fingers **were amputated.** Employee 1 **did receive training** on how to perform this operation. There were **no PPE issues** related to this incident.

Investigation Activity Abstract -

Key Words:

- Used to track and access information on types of incidents, industries, injuries, causes, etc.
- Provided for CSHO information to assist in searching incident data
- Use of preferred terms will make searches easier
  - For example, "aerial lift" is a keyword. The abstract should use that term rather than "cherry picker" or "bucket truck." However, since the keywords tend to be general terms, the abstract should also describe in more detail the specific type of equipment involved. For example, the abstract could state that an aerial lift was a bucket-type mounted on an extensible, rotating boom.

Abstract Questions

You will be required to fill in all the text fields. We may see a future directive on filling out these text fields

IMMLANG

- Complete if IMMLANG coded Y on Inspection Activity
- Designed to track fatalities among Hispanic and immigrant workers and assess the impact of potential language barriers and training deficiencies on fatal incidents

ImmLang Questionnaire

Occupational Codes

Occupational codes on Investigation Activity Form:

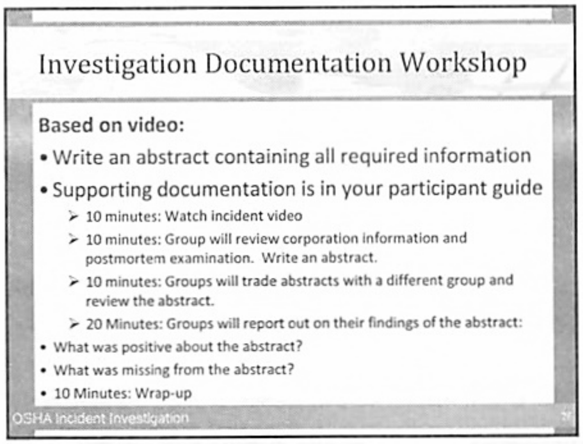
- Useful for data collection
- Currently mandatory only for State-plan States, but all CSHOs encouraged to use
- Identify the job the person was performing at the time of the event

Related Event Code (REC)

- The related event code “A” is entered in the **Violation Summary** if any item cited is directly related to the occurrence of the fatality or catastrophe

WORKSHOP

OSHA Incident Investigation



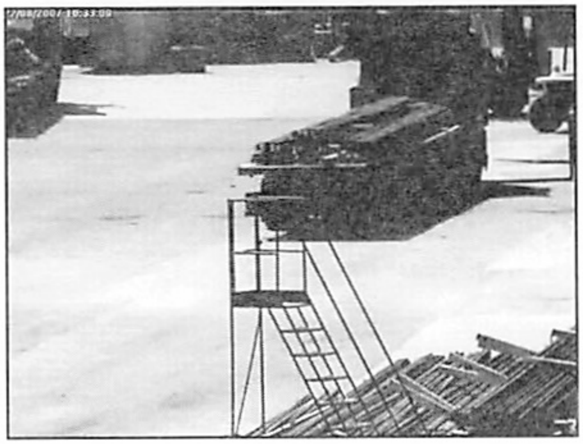
Investigation Documentation Workshop

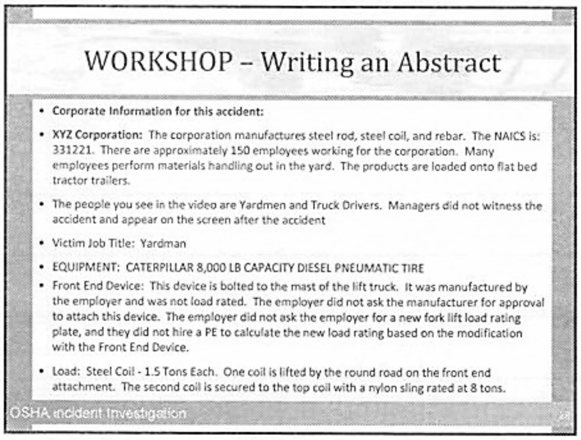
Based on video:

- Write an abstract containing all required information
- Supporting documentation is in your participant guide
  - ➢ 10 minutes: Watch incident video
  - ➢ 10 minutes: Group will review corporation information and postmortem examination. Write an abstract.
  - ➢ 10 minutes: Groups will trade abstracts with a different group and review the abstract.
  - ➢ 20 Minutes: Groups will report out on their findings of the abstract:
- What was positive about the abstract?
- What was missing from the abstract?
- 10 Minutes: Wrap-up

OSHA Incident Investigation

08-22-07 (1035 m)





WORKSHOP – Writing an Abstract

- **Corporate Information for this accident:**
- **XYZ Corporation:** The corporation manufactures steel rod, steel coil, and rebar. The NAICS is: 331221. There are approximately 150 employees working for the corporation. Many employees perform materials handling out in the yard. The products are loaded onto flat bed tractor trailers.
- The people you see in the video are Yardmen and Truck Drivers. Managers did not witness the accident and appear on the screen after the accident
- Victim Job Title: Yardman
- EQUIPMENT: CATERPILLAR 8,000 LB CAPACITY DIESEL PNEUMATIC TIRE
- Front End Device: This device is bolted to the mast of the lift truck. It was manufactured by the employer and was not load rated. The employer did not ask the manufacturer for approval to attach this device. The employer did not ask the employer for a new fork lift load rating plate, and they did not hire a PE to calculate the new load rating based on the modification with the Front End Device.
- Load: Steel Coil - 1.5 Tons Each. One coil is lifted by the round road on the front end attachment. The second coil is secured to the top coil with a nylon sling rated at 8 tons.

Practice: *Abstract Writing*

Student Instructions

Purpose: To write an abstract

Instructions

1. For this practice, you will be assigned to a work group by your instructor. Your group will receive corporate information and postmortem examination for the incident.
2. Your group will watch a video on the incident.
3. Your group will write an abstract for the incident based off of the information provided.
4. Your group will exchange abstract with another group.
5. Your group will review the abstract for errors, using the abstract review form.
6. The Instructor will have each table report out on the findings of the other group's abstract. Please note that although you may assign a spokesperson, the instructor reserves the right to ask questions of each person within the group.
7. Be sure to consult with your instructor, if you have any questions or require additional clarification.

Abstract Writing Workshop

You group task is to write an abstract for the accident that you will shortly view. The group must submit one complete abstract. The abstract will be reviewed by all the AAD's in an adjacent group.

Web Site: http://www.youtube.com/watch?v=0ZDX8Zds-Ak&feature=related

Corporate Information for this accident:

XYZ Corporation: The corporation manufactures steel rod, steel coil, and rebar. The NAICS is: 331221. There are approximately 150 employees working for the corporation. Many employees perform materials handling out in the yard. The products are loaded onto flat bed tractor trailers.

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OFFICE OF THE MEDICAL EXAMINER
County of Cook, Illinois

REPORT OF POSTMORTEM EXAMINATION

NAME Darrell McQue CASE NUMBER: 350 August 2007

AGE 34 RACE Caucasian SEX Male DATE OF DEATH 08-22-07

ADDRESS OF DECENDENT 456 E. Reynolds St., Springfield, IL 60000

DATE EXAMINED 08-22-07 CITY AND STATE Chicago, Illinois

EXAMINED BY Kirt Drudge

EXTERNAL EXAMINATION

The body is received clothed in a hospital gown and disposable paper boxer shorts.

The body is that of an adult White Male, weighting 185 pounds, measuring 5 feet 8 inches in height, and appearing the stated age of 34 years.

The body is cold to touch. Rigor mortis is present to an equal extent in all joints. There is prosterior fixed postmortem lividity.

The scalp hair is brown. The eyes are closed. The irides are blue. The pupils are symmetric and centrally fixed. The ears are unremarkable. The skeleton of the nose is intact, however fractured. The teeth are natural and two teeth are missing.

The neck is not hyper mobile. However there is a contortion to the right rear side of the body.

The chest is symmetric. The abdomen is round. The genitalia are normal circumcised male.

The fingernails are long and dirty. The toenails are short and dirty.

EVIDENCE OF INJURY

1. On the left side of the brow there is evidence of head trauma in the formation of a contusion. The skull is fractured in the frontal left lobe.

2. The third and fourth vertebrae are crushed from left to right.

3. The left shoulder is shattered from front to back.

4. The right knee cap is shattered from front to back

5. The left wrist is shattered.

6. The right hand and index finger are dislocated.

INTERNAL EXAMINATION

BODY CAVITIES: The body is entered by means of a Y-shaped incision. All organs are present in their usually anatomic positions. All organs are not in their usual anatomic state. The stomach, left kidney and large intestine are all crushed. The pericardial, pleural and peritoneal have excessive amounts of serous fluid. The pericardial has adhesions.

NECK ORGANS: The anterior muscles of the neck show evidence of hemorrhage. The cartilages of the larynx and epiglottis are intact. The hyoid bone is dislodged. Special examination of the tongue shows no evidence of injury.

CARDIOVASCULAR: The heart weighs 480 grams. The epicardial coronary arteries pursue their usual anatomic course and are free of pathologic change. The valves of the heart and great vessels are unremarkable. Serial sectioning of the myocardium show left ventricle wall thickness of 1.9 cm. No additional focal areas of pathologic change are evident.

RESPIRATORY SYSTEM: The lung weighs 894 grams. The external surface of the lungs is dark red. Serial sectioning of the hepatic parenchyma shows congestion. No nodules or granuloma are present. The pulmonary arteries are free of thromboemboli.

HEPATOBILLAIRY SYSTEM: The liver weighs 2259 grams. The external surface of the liver is tan and smooth. Serial sectioning of the hepatic parenchyma shows fatty change. The gallbladder and biliary tract pursue their usual anatomic course and are free of pathologic change. The gallbladder contains 40 cc's of thick green bile.

INTERNAL EXAMINATION: (Continued)

GASTROINTESTINAL SYSTEM: The esophagus is without special note. The stomach is empty. The duodenum and small intestines are without special note. The large intestine appears to be crushed from the exterior to the interior. There were 53 cc's of bile in the large intestine.

SPLEEN: The spleen weighs 243 grams. The splenic capsule has ruptured. Serial sectioning of the splenic capsule shows congestion. The spleen contains 15 cc's of white bile.

GENITOURINARY SYSTEM: The kidneys weight 396 grams. The capsules strip with ease. The external surfaces of the kidneys are dark red and smooth. The left kidney has a contusion on the frontal and left portion. On cut section, the renal parenchyma shows congestion. The renal pelves have been crushed from exterior to interior. The urinary bladder is without special note.

CENTRAL NERVOUS SYTEM: The scalp shows a laceration on the left frontal lobe. There is a subgaleal hemorrhage on the frontal left lobe. Upon entering the cranial cavity there is evidence of intracranial hemorrhage. There is evidence of a 9 inch fracture on the frontal left lobe of the cranium. The brain weighs 2228 grams. The vessels at the base of the brain are well developed and patent. The base of the skull is intact.

MUSCULOSKELETAL SYSTEM: The right knee cap is shattered. The long bones of both lower extremities are intact to palpation. The left shoulder is shattered from front to back. The left wrist is shattered. The right hand and index finger are dislocated. The first and second vertebrae of the cervical spine are crushed.

DIAGNOSIS:

1. Cranial Hemorrhaging
2. Cranial Fracture
3. Knee, wrist, hand and finger fracture.
4. Internal Bleeding

OPINION: In consideration of the circumstances surrounding his death, the available medical history, and oral conversation with the Occupational Safety and Health Administration, and the autopsy examination of the body, the death of this 34 year old White male, Darrel McQue, is ascribed to severe head trauma.

MANNER OF DEATH: Accident

Kirt R. Drudge
Deputy Medical Examiner

OFFICE OF THE MEDICAL EXAMINER
COUNTY OF COOK, ILLINOIS

RESULTS OF TOXICOLOGIC ANALYSES

M.E. CASE NO. 350 August 2007 TOX. CASE NO. 992755

DECEASED NAME: DARREL MCQUE

RACE: WHITE SEX: MALE AGE: 34

AUTOPSY DATE: 08-22-07 REPORT DATE 08-22-07

PATHOLOGIST: KIRT DRUDGE

DRUG/TISSUE	RESULTS	AMOUNTS
CARBON MONOXIDE BLOOD	NEGATIVE	
BENZOYLECGONINE BLOOD	NEGATIVE	
ETHANOL BLOOD	NEGATIVE	
OPIATES BLOOD	POSITIVE	25 mcg/g THC
OPIATES URINE	POSITIVE	20 mcg/g THC

RONALD C. ROCKFORD, PH.D.
TOXICOLOGIST

Abstract Review

1. Is the Abstract written like a story?

2. Did the Writer separate thoughts with proper writing structure:

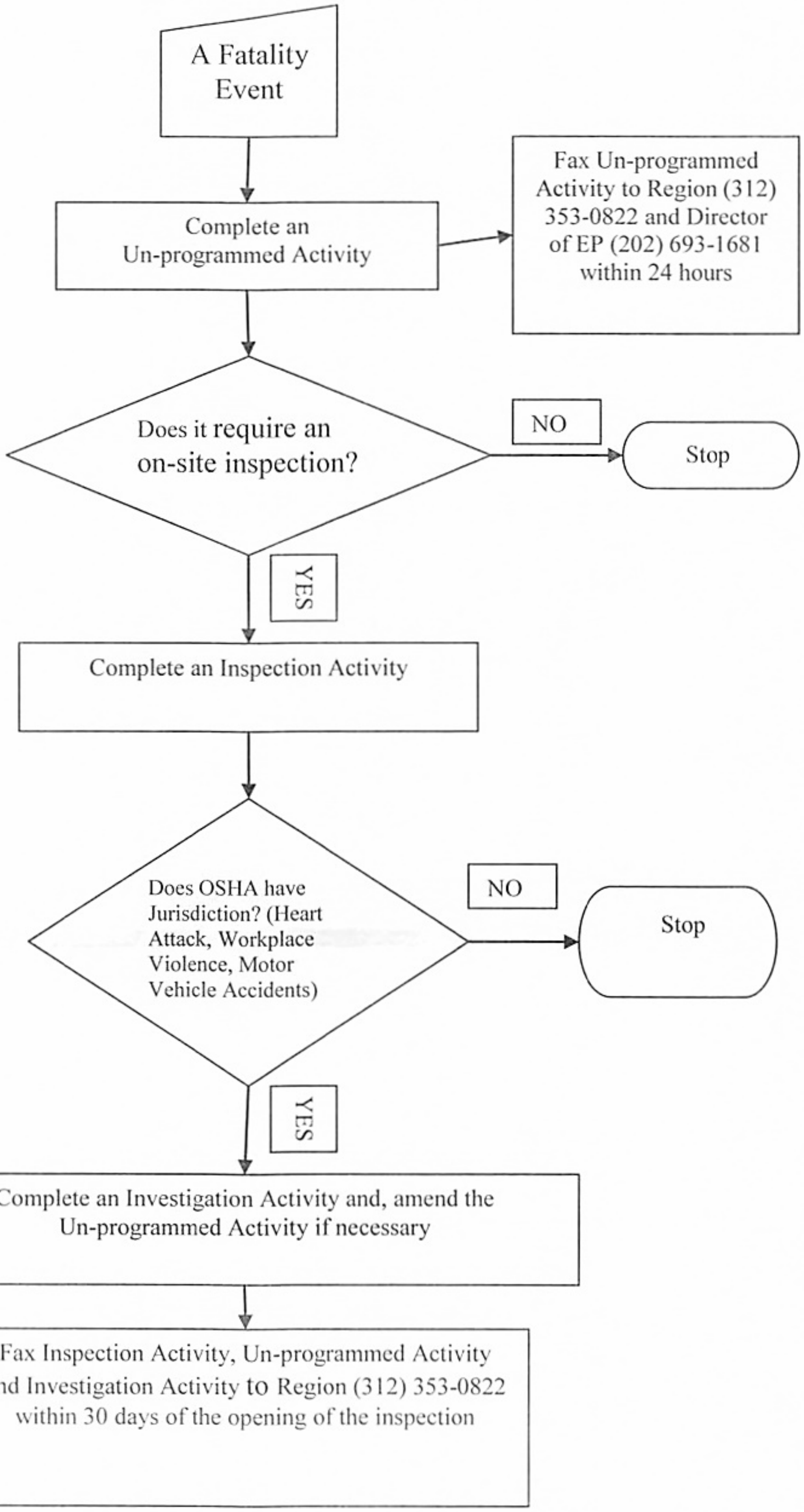
   No run on sentences
   The writer did not use more than one "and" or "but" in a sentence
   There are several paragraphs used to separate different accident evidence
      Corporation and what they do
      Relevant Witnesses
      Operation description
      Cause of the accident

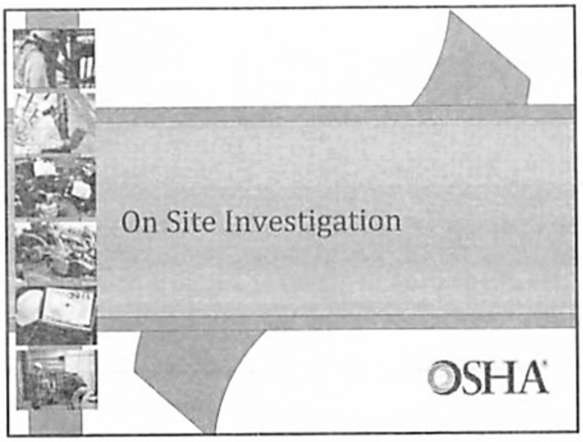
3. Did the writer address all Abstract pertinent information listed in the checklist?

4. Did the writer only explain the facts? There should be no opinion written into the Abstract.

5. Can you understand what happened and why the fatality occurred?

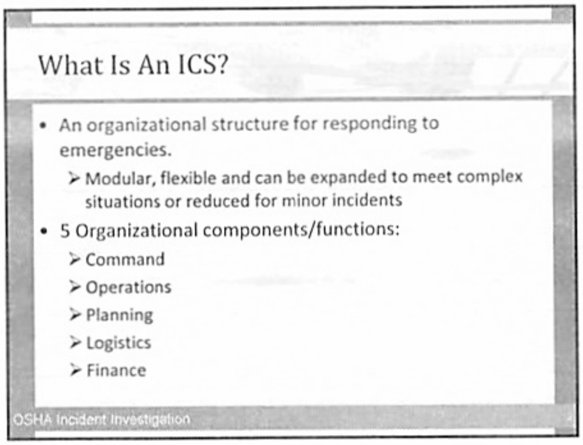
Fatality Reporting Flow Chart


A Fatality Event
Complete an Un-programmed Activity
Fax Un-programmed Activity to Region (312) 353-0822 and Director of EP (202) 693-1681 within 24 hours
Does it require an on-site inspection?
NO
Stop
YES
Complete an Inspection Activity
Does OSHA have Jurisdiction? (Heart Attack, Workplace Violence, Motor Vehicle Accidents)
NO
Stop
YES
Complete an Investigation Activity and, amend the Un-programmed Activity if necessary
Fax Inspection Activity, Un-programmed Activity and Investigation Activity to Region (312) 353-0822 within 30 days of the opening of the inspection



On Site Investigation

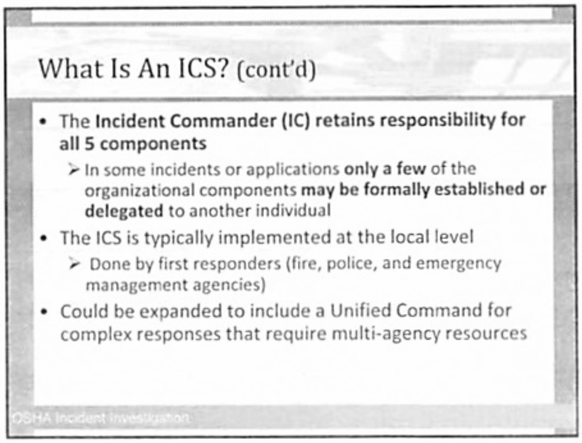
OSHA



What Is An ICS?

- An organizational structure for responding to emergencies.
  - ➢ Modular, flexible and can be expanded to meet complex situations or reduced for minor incidents
- 5 Organizational components/functions:
  - ➢ Command
  - ➢ Operations
  - ➢ Planning
  - ➢ Logistics
  - ➢ Finance

OSHA Incident Investigation



What Is An ICS? (cont'd)

- The **Incident Commander (IC) retains responsibility for all 5 components**
  - ➢ In some incidents or applications **only a few** of the organizational components **may be formally established or delegated** to another individual
- The ICS is typically implemented at the local level
  - ➢ Done by first responders (fire, police, and emergency management agencies)
- Could be expanded to include a Unified Command for complex responses that require multi-agency resources

OSHA Incident Investigation

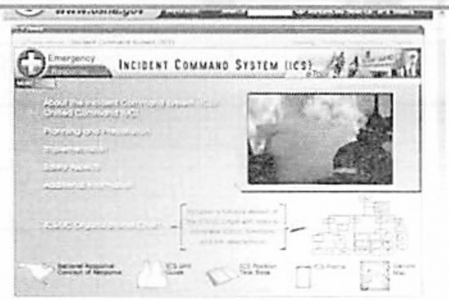
Where Is An ICS Usually Found?

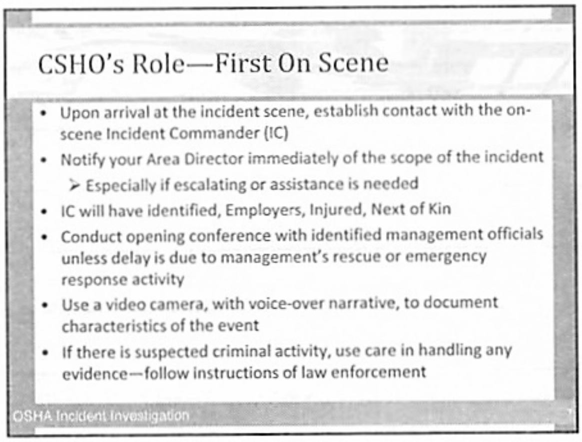
- OSHA compliance personnel may encounter an Incident Command System:
  - In local Incident scenes where a local authority has set up an ICS (i.e. fire/police departments)
  - In large-scale emergencies (Regional Emergency Management Plan may be activated)

OSHA's Role

- The OSH Act assigns the role of protection of employees from occupationally-related safety and health hazards
- This role may encompass
  - Enforcement of regulations and/or
  - Technical assistance and consultation

http://www.osha.gov/SLTC/etools/ics/index.html

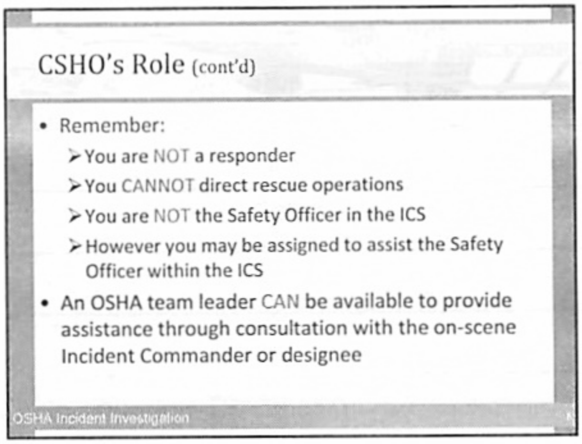




CSHO's Role—First On Scene

- Upon arrival at the incident scene, establish contact with the on-scene Incident Commander (IC)
- Notify your Area Director immediately of the scope of the incident
  - ➢ Especially if escalating or assistance is needed
- IC will have identified, Employers, Injured, Next of Kin
- Conduct opening conference with identified management officials unless delay is due to management's rescue or emergency response activity
- Use a video camera, with voice-over narrative, to document characteristics of the event
- If there is suspected criminal activity, use care in handling any evidence—follow instructions of law enforcement

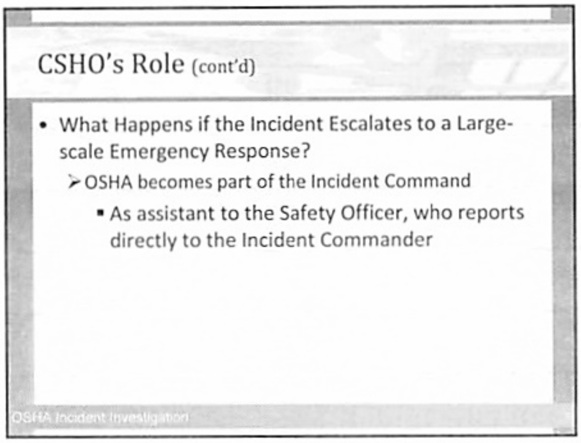
OSHA Incident Investigation



CSHO's Role (cont'd)

- Remember:
  - ➢ You are NOT a responder
  - ➢ You CANNOT direct rescue operations
  - ➢ You are NOT the Safety Officer in the ICS
  - ➢ However you may be assigned to assist the Safety Officer within the ICS
- An OSHA team leader CAN be available to provide assistance through consultation with the on-scene Incident Commander or designee

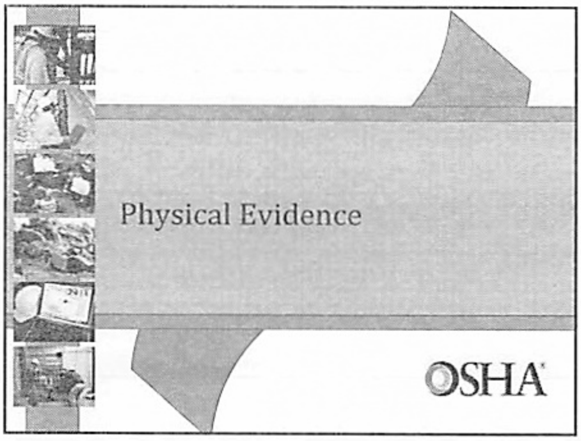
OSHA Incident Investigation



CSHO's Role (cont'd)

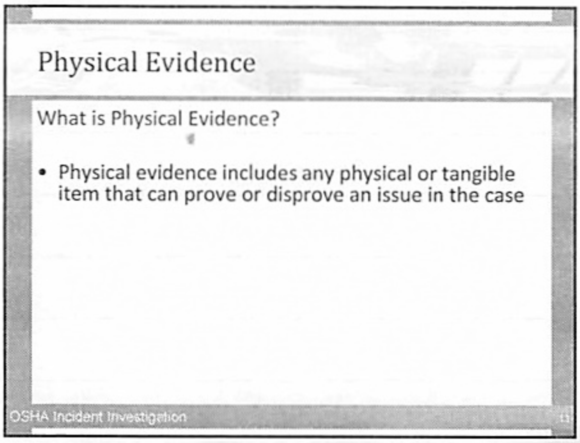
- What Happens if the Incident Escalates to a Large-scale Emergency Response?
  - ➢ OSHA becomes part of the Incident Command
    - ▪ As assistant to the Safety Officer, who reports directly to the Incident Commander

OSHA Incident Investigation



Physical Evidence

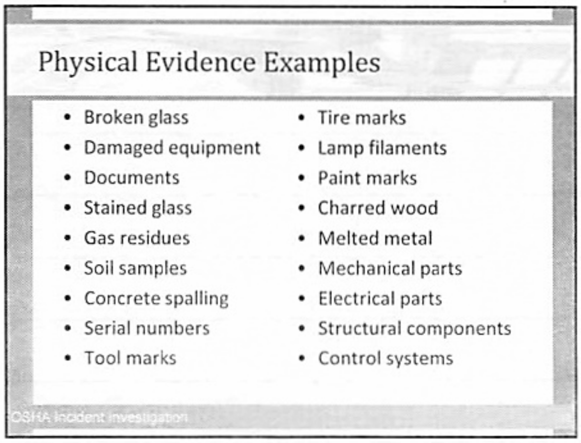
OSHA



Physical Evidence

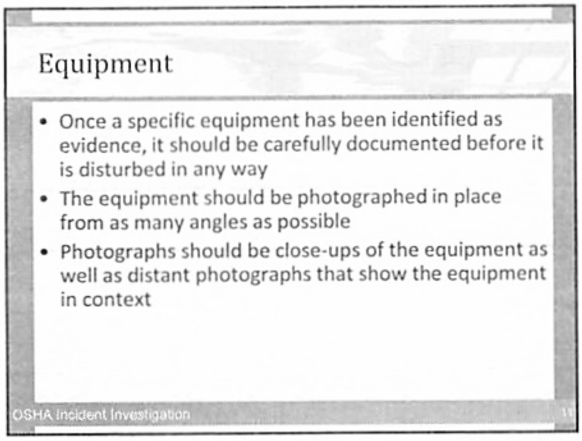
What is Physical Evidence?

- Physical evidence includes any physical or tangible item that can prove or disprove an issue in the case



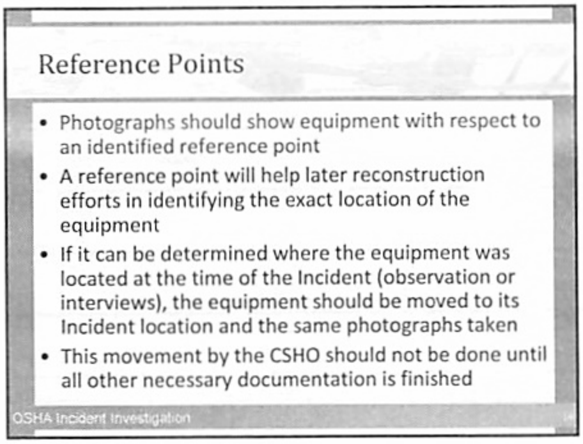
Physical Evidence Examples

- Broken glass
- Damaged equipment
- Documents
- Stained glass
- Gas residues
- Soil samples
- Concrete spalling
- Serial numbers
- Tool marks
- Tire marks
- Lamp filaments
- Paint marks
- Charred wood
- Melted metal
- Mechanical parts
- Electrical parts
- Structural components
- Control systems



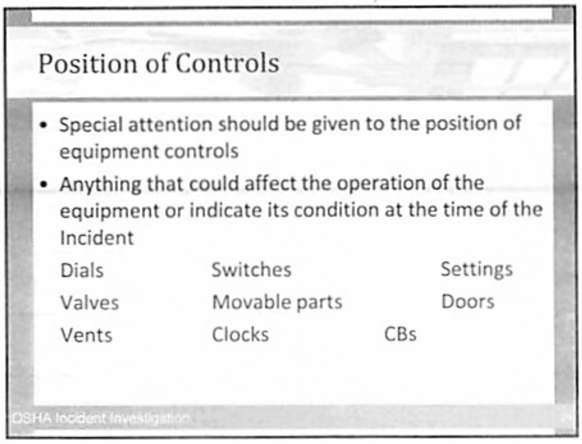
Equipment

- Once a specific equipment has been identified as evidence, it should be carefully documented before it is disturbed in any way
- The equipment should be photographed in place from as many angles as possible
- Photographs should be close-ups of the equipment as well as distant photographs that show the equipment in context



Reference Points

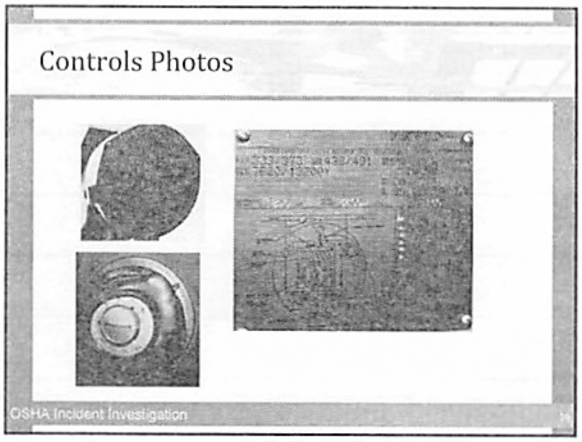
- Photographs should show equipment with respect to an identified reference point
- A reference point will help later reconstruction efforts in identifying the exact location of the equipment
- If it can be determined where the equipment was located at the time of the Incident (observation or interviews), the equipment should be moved to its Incident location and the same photographs taken
- This movement by the CSHO should not be done until all other necessary documentation is finished



Position of Controls

- Special attention should be given to the position of equipment controls
- Anything that could affect the operation of the equipment or indicate its condition at the time of the Incident

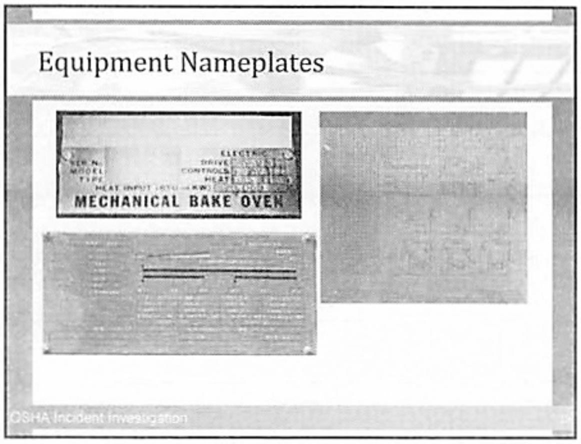
Dials
Valves
Vents
Switches
Movable parts
Clocks
CBs
Settings
Doors



Controls Photos

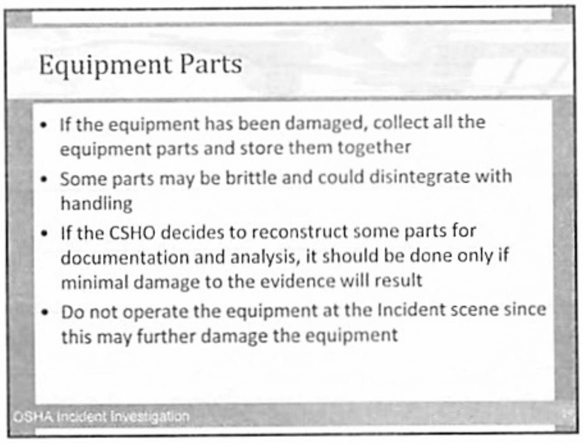
Equipment Information

- Manufacturer, model number, serial number, ratings, date of mfgr, warnings, any other data
- Equipment nameplates should be photographed close-up and documented in detail
- If the equipment has to be moved to get this information, do it with minimal disturbance to the equipment and the Incident scene
- The equipment should not be moved before position of controls is documented



Equipment Nameplates

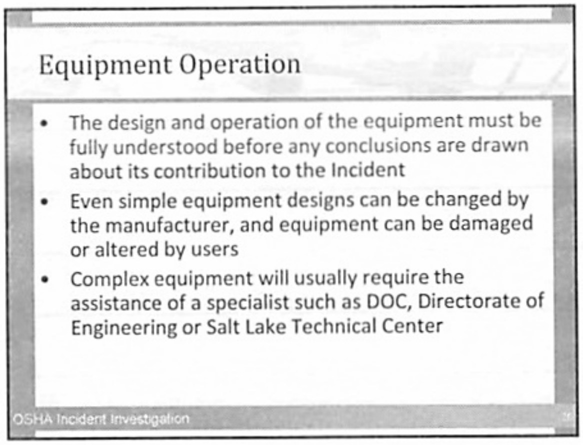
ELECTRIC
SER. N.
MODEL
TYPE
DRIVE
CONTROLS
HEAT
HEAT INPUT (BTU-KW)
MECHANICAL BAKE OVEN



Equipment Parts

- If the equipment has been damaged, collect all the equipment parts and store them together
- Some parts may be brittle and could disintegrate with handling
- If the CSHO decides to reconstruct some parts for documentation and analysis, it should be done only if minimal damage to the evidence will result
- Do not operate the equipment at the Incident scene since this may further damage the equipment

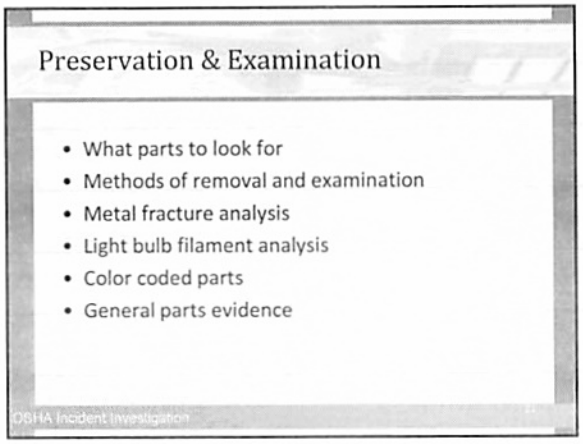
OSHA Incident Investigation



Equipment Operation

- The design and operation of the equipment must be fully understood before any conclusions are drawn about its contribution to the Incident
- Even simple equipment designs can be changed by the manufacturer, and equipment can be damaged or altered by users
- Complex equipment will usually require the assistance of a specialist such as DOC, Directorate of Engineering or Salt Lake Technical Center

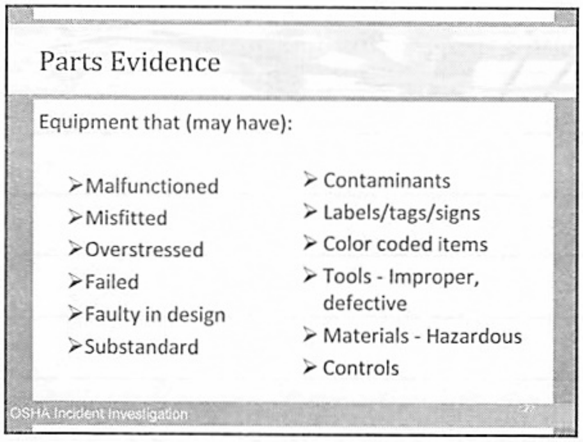
OSHA Incident Investigation



Preservation & Examination

- What parts to look for
- Methods of removal and examination
- Metal fracture analysis
- Light bulb filament analysis
- Color coded parts
- General parts evidence

OSHA Incident Investigation

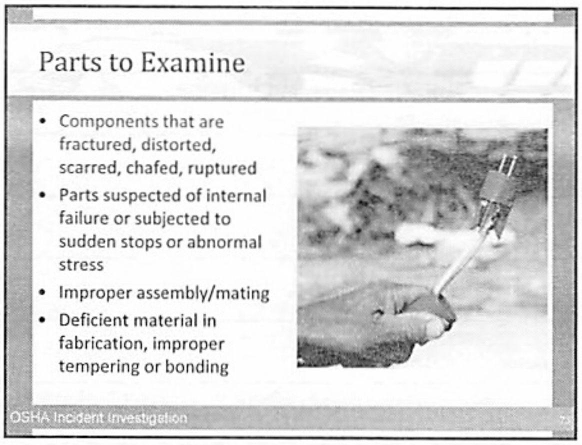


Parts Evidence

Equipment that (may have):

- Malfunctioned
- Misfitted
- Overstressed
- Failed
- Faulty in design
- Substandard
- Contaminants
- Labels/tags/signs
- Color coded items
- Tools - Improper, defective
- Materials - Hazardous
- Controls

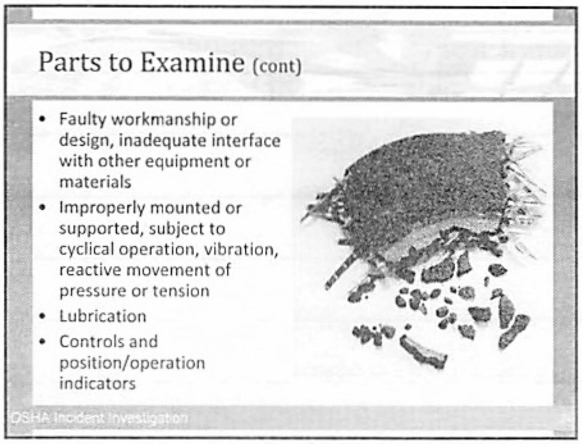
OSHA Incident Investigation



Parts to Examine

- Components that are fractured, distorted, scarred, chafed, ruptured
- Parts suspected of internal failure or subjected to sudden stops or abnormal stress
- Improper assembly/mating
- Deficient material in fabrication, improper tempering or bonding

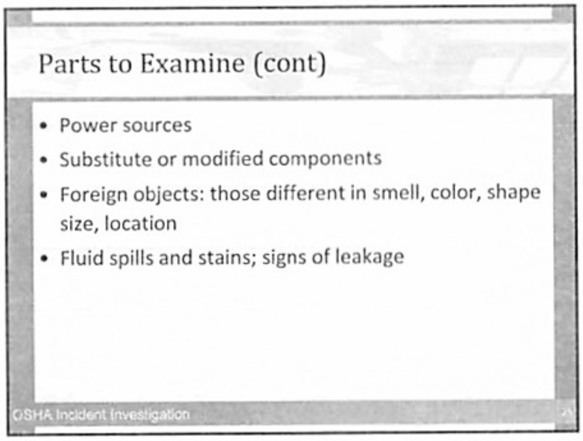
OSHA Incident Investigation



Parts to Examine (cont)

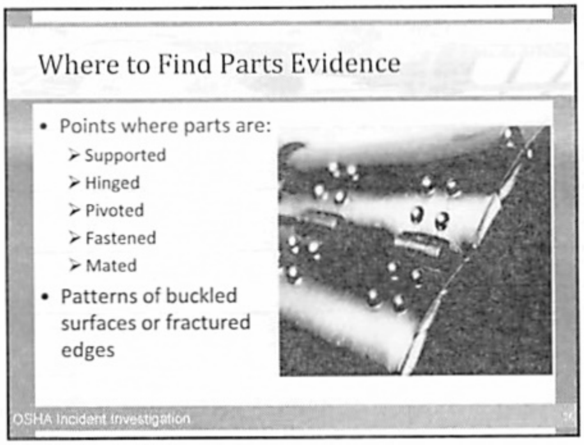
- Faulty workmanship or design, inadequate interface with other equipment or materials
- Improperly mounted or supported, subject to cyclical operation, vibration, reactive movement of pressure or tension
- Lubrication
- Controls and position/operation indicators

OSHA Incident Investigation



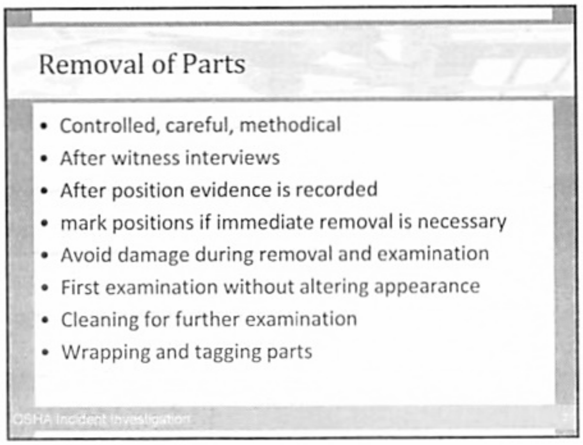
Parts to Examine (cont)

- Power sources
- Substitute or modified components
- Foreign objects: those different in smell, color, shape size, location
- Fluid spills and stains; signs of leakage



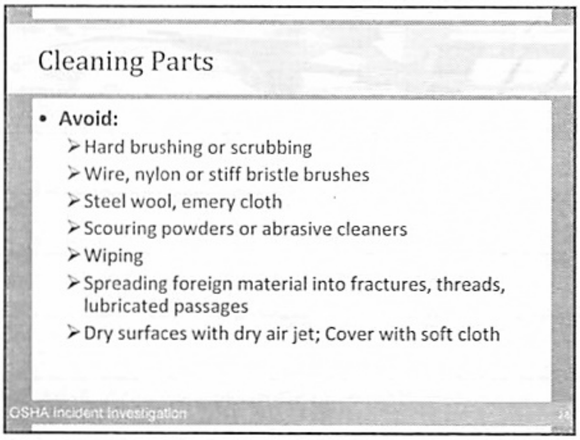
Where to Find Parts Evidence

- Points where parts are:
  - ➢ Supported
  - ➢ Hinged
  - ➢ Pivoted
  - ➢ Fastened
  - ➢ Mated
- Patterns of buckled surfaces or fractured edges



Removal of Parts

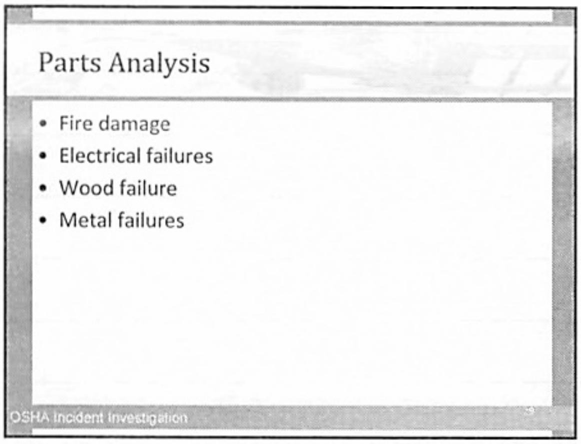
- Controlled, careful, methodical
- After witness interviews
- After position evidence is recorded
- mark positions if immediate removal is necessary
- Avoid damage during removal and examination
- First examination without altering appearance
- Cleaning for further examination
- Wrapping and tagging parts



Cleaning Parts

- **Avoid:**
  - ➢ Hard brushing or scrubbing
  - ➢ Wire, nylon or stiff bristle brushes
  - ➢ Steel wool, emery cloth
  - ➢ Scouring powders or abrasive cleaners
  - ➢ Wiping
  - ➢ Spreading foreign material into fractures, threads, lubricated passages
  - ➢ Dry surfaces with dry air jet; Cover with soft cloth

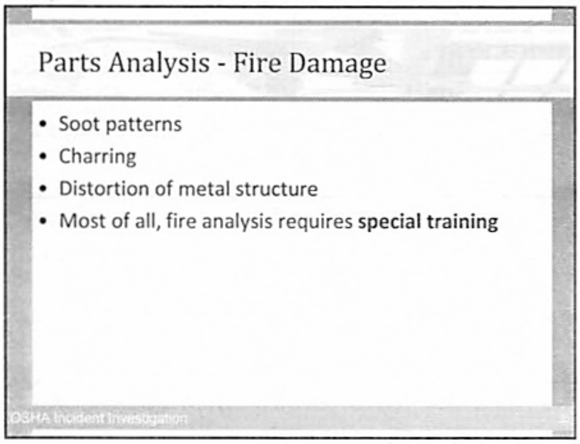
OSHA Incident Investigation



Parts Analysis

- Fire damage
- Electrical failures
- Wood failure
- Metal failures

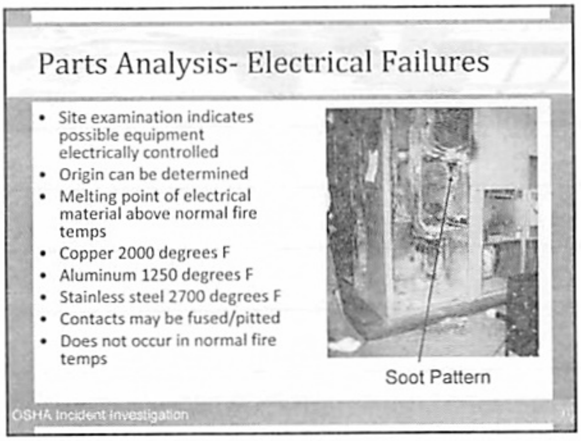
OSHA Incident Investigation



Parts Analysis - Fire Damage

- Soot patterns
- Charring
- Distortion of metal structure
- Most of all, fire analysis requires **special training**

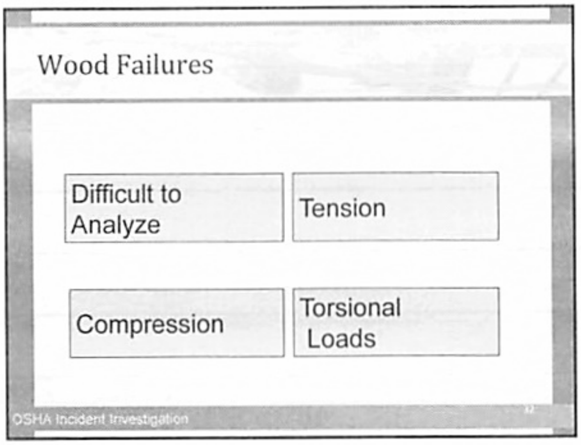
OSHA Incident Investigation



Parts Analysis- Electrical Failures

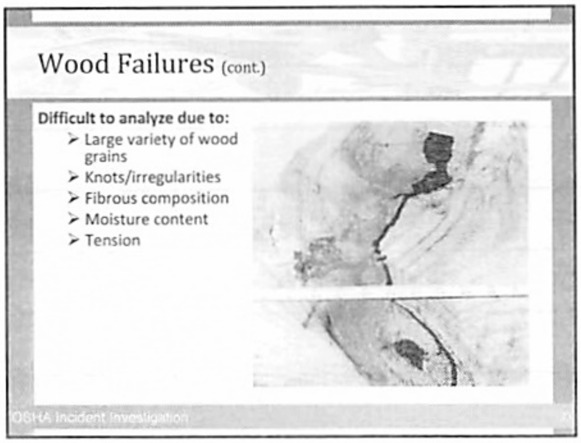
- Site examination indicates possible equipment electrically controlled
- Origin can be determined
- Melting point of electrical material above normal fire temps
- Copper 2000 degrees F
- Aluminum 1250 degrees F
- Stainless steel 2700 degrees F
- Contacts may be fused/pitted
- Does not occur in normal fire temps

Soot Pattern



Wood Failures

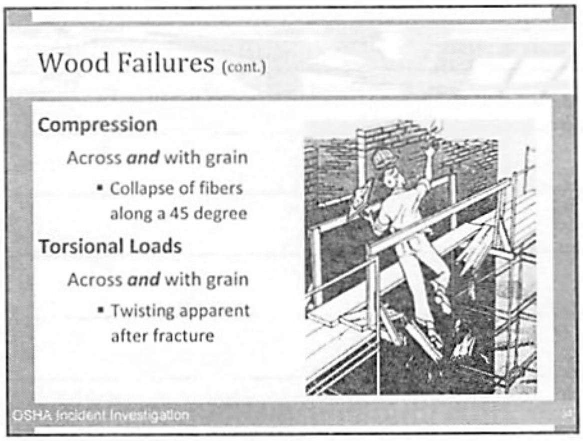
Difficult to Analyze	Tension
Compression	Torsional Loads



Wood Failures (cont.)

Difficult to analyze due to:

- Large variety of wood grains
- Knots/irregularities
- Fibrous composition
- Moisture content
- Tension



Wood Failures (cont.)

Compression

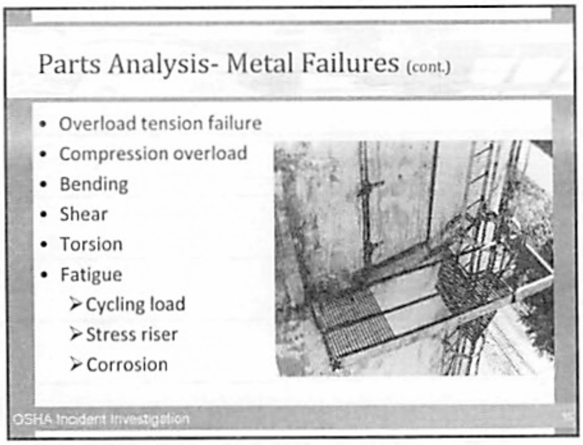
Across ***and*** with grain

- Collapse of fibers along a 45 degree

Torsional Loads

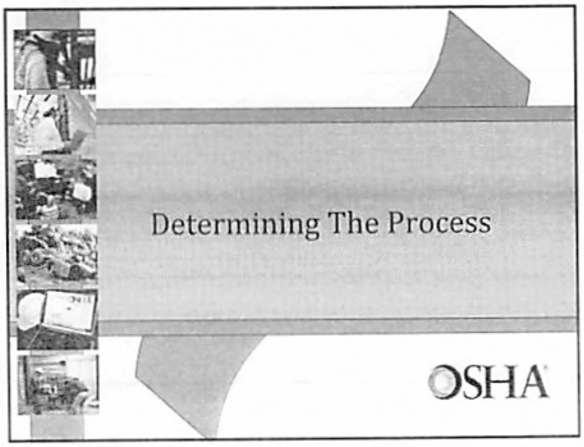
Across ***and*** with grain

- Twisting apparent after fracture

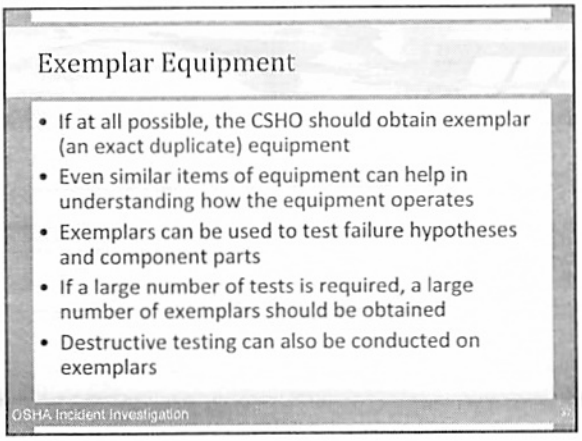


Parts Analysis- Metal Failures (cont.)

- Overload tension failure
- Compression overload
- Bending
- Shear
- Torsion
- Fatigue
  - Cycling load
  - Stress riser
  - Corrosion



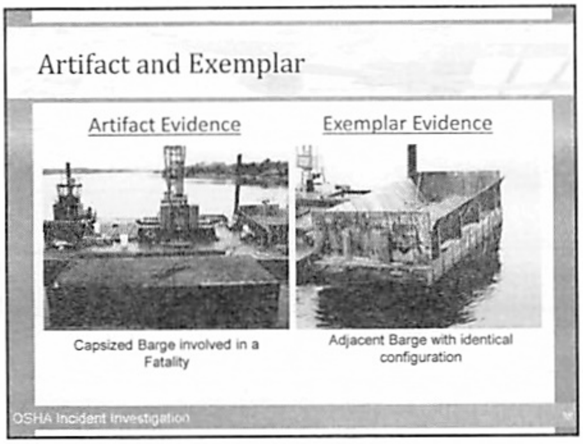
Determining The Process



Exemplar Equipment

- If at all possible, the CSHO should obtain exemplar (an exact duplicate) equipment
- Even similar items of equipment can help in understanding how the equipment operates
- Exemplars can be used to test failure hypotheses and component parts
- If a large number of tests is required, a large number of exemplars should be obtained
- Destructive testing can also be conducted on exemplars

OSHA Incident Investigation



Artifact and Exemplar

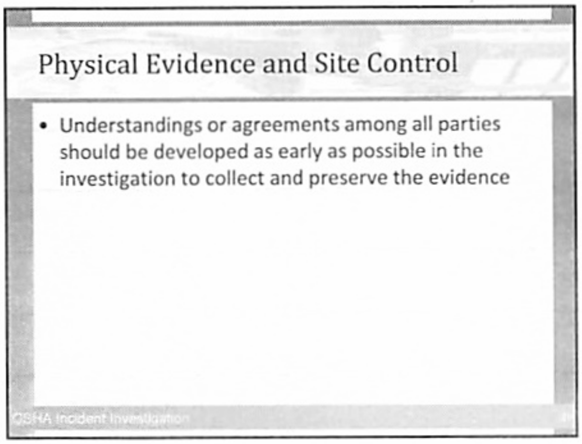
Artifact Evidence

Capsized Barge involved in a Fatality

Exemplar Evidence

Adjacent Barge with identical configuration

OSHA Incident Investigation



Physical Evidence and Site Control

- Understandings or agreements among all parties should be developed as early as possible in the investigation to collect and preserve the evidence

OSHA Incident Investigation

Evidence and Site Control Agreements

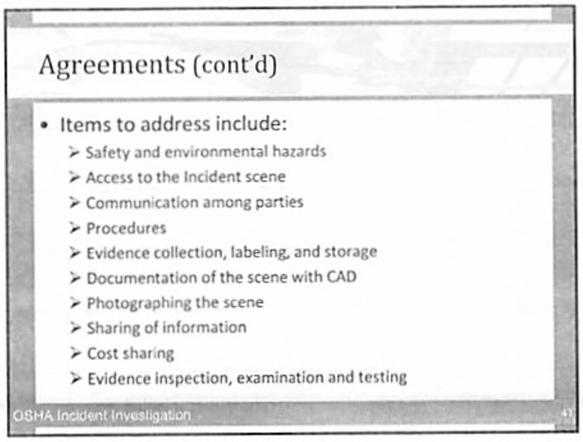
- New memorandum 5/12/2014

Evidence and Site Control Agreements

- New memorandum 5/12/2014
  - ➢Purpose
  - ➢Site Preservation
  - ➢Evidence Collection and Storage
  - ➢Testing
  - ➢Samples and Sampling
  - ➢Additional Terms
    - General understanding and responsibilities of those involved

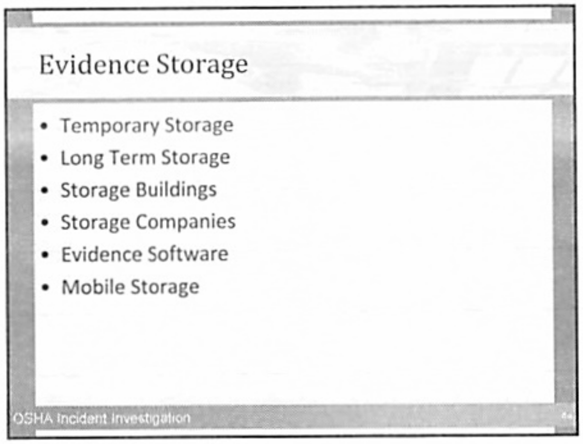
Physical Evidence Preservation Agreements

- Physical evidence is any physical or tangible item that tends to prove or disprove a particular fact or issue
- Why is evidence preservation important
- How can evidence be preserved



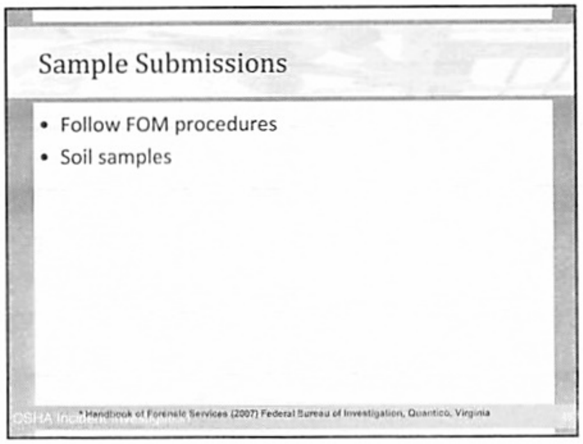
Agreements (cont'd)

- Items to address include:
  - Safety and environmental hazards
  - Access to the Incident scene
  - Communication among parties
  - Procedures
  - Evidence collection, labeling, and storage
  - Documentation of the scene with CAD
  - Photographing the scene
  - Sharing of information
  - Cost sharing
  - Evidence inspection, examination and testing



Evidence Storage

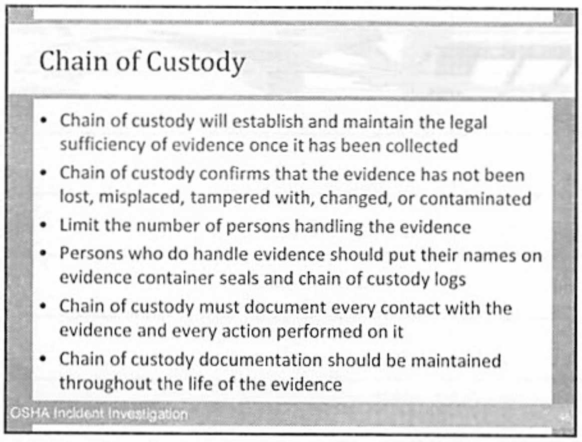
- Temporary Storage
- Long Term Storage
- Storage Buildings
- Storage Companies
- Evidence Software
- Mobile Storage



Sample Submissions

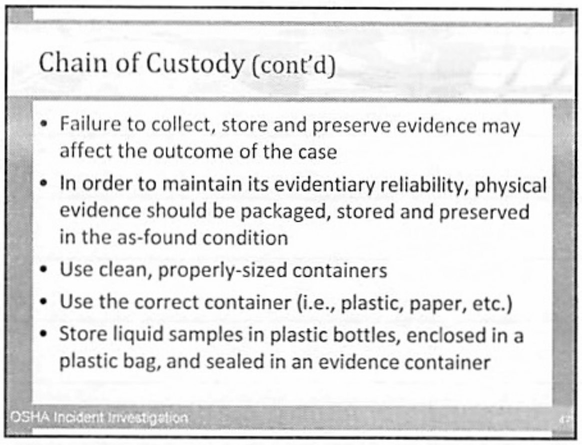
- Follow FOM procedures
- Soil samples

* Handbook of Forensic Services (2007) Federal Bureau of Investigation, Quantico, Virginia



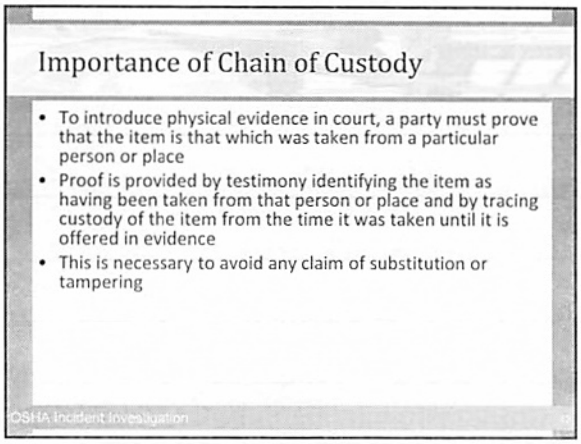
Chain of Custody

- Chain of custody will establish and maintain the legal sufficiency of evidence once it has been collected
- Chain of custody confirms that the evidence has not been lost, misplaced, tampered with, changed, or contaminated
- Limit the number of persons handling the evidence
- Persons who do handle evidence should put their names on evidence container seals and chain of custody logs
- Chain of custody must document every contact with the evidence and every action performed on it
- Chain of custody documentation should be maintained throughout the life of the evidence



Chain of Custody (cont'd)

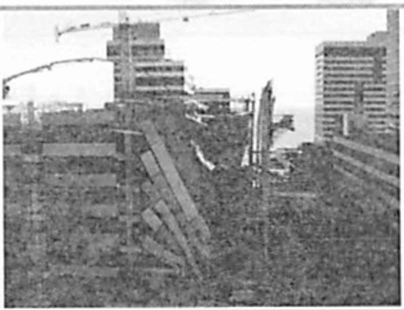
- Failure to collect, store and preserve evidence may affect the outcome of the case
- In order to maintain its evidentiary reliability, physical evidence should be packaged, stored and preserved in the as-found condition
- Use clean, properly-sized containers
- Use the correct container (i.e., plastic, paper, etc.)
- Store liquid samples in plastic bottles, enclosed in a plastic bag, and sealed in an evidence container



Importance of Chain of Custody

- To introduce physical evidence in court, a party must prove that the item is that which was taken from a particular person or place
- Proof is provided by testimony identifying the item as having been taken from that person or place and by tracing custody of the item from the time it was taken until it is offered in evidence
- This is necessary to avoid any claim of substitution or tampering

Tropicana Collapse



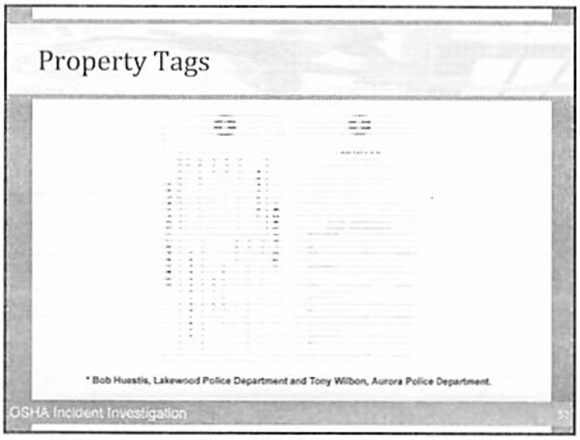
Tropicana Evidence Collection Agreement

- Items depicted on the plan:
- The following items in the debris field or that spilled onto adjacent areas:
  - ➢ All shoring system components
  - ➢ All galvanized reinforcing mats.
  - ➢ All reinforcing steel.
  - ➢ All temperature reinforcing steel.
- Five (5) four-foot long sections of pre-cast parapet walls, one each from levels P-3 through P-7.
- Additional portions of columns D-5, E, E-5 and F, all on Line 1, that will be removed.
- Additional portions of shearwall, with slab connections, that will be removed.

At Yard

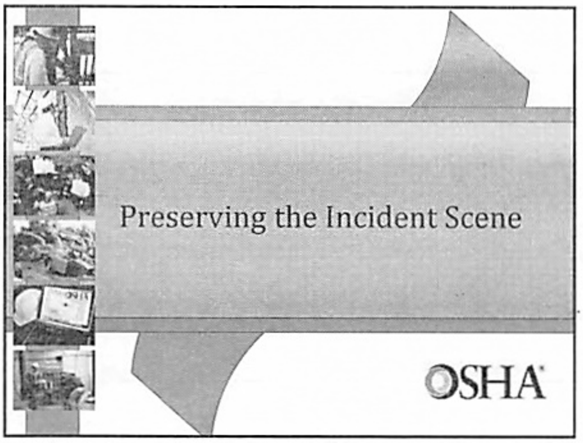
- Shear Wall* P5-Up
- Column D/1 P4-Up
- Column D.5/1 P2-Up
- Column E/1 P5-Up
- Column E.5/1 P4-Up
- Column F/1 P4-Up

*Cores were taken from Shear Wall

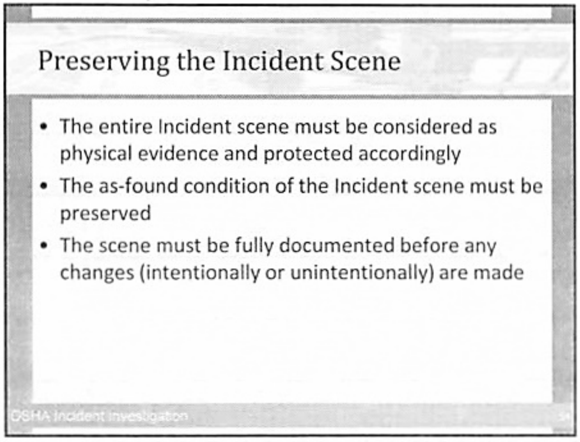


Property Tags

* Bob Huestis, Lakewood Police Department and Tony Wilbon, Aurora Police Department.

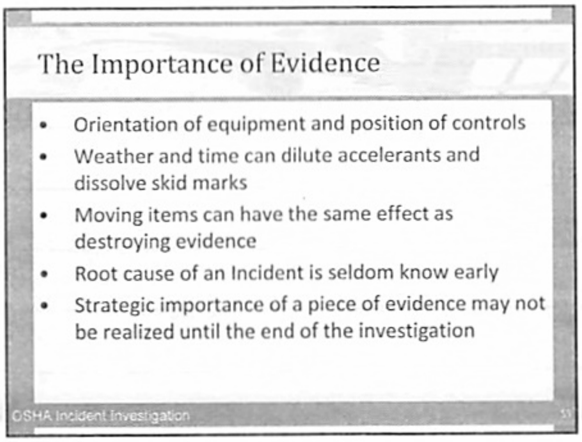


Preserving the Incident Scene



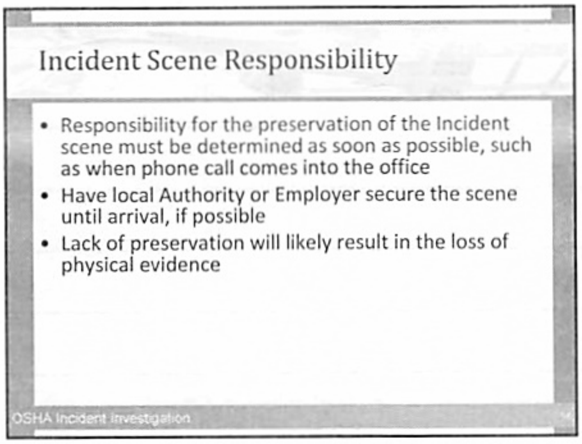
Preserving the Incident Scene

- The entire Incident scene must be considered as physical evidence and protected accordingly
- The as-found condition of the Incident scene must be preserved
- The scene must be fully documented before any changes (intentionally or unintentionally) are made



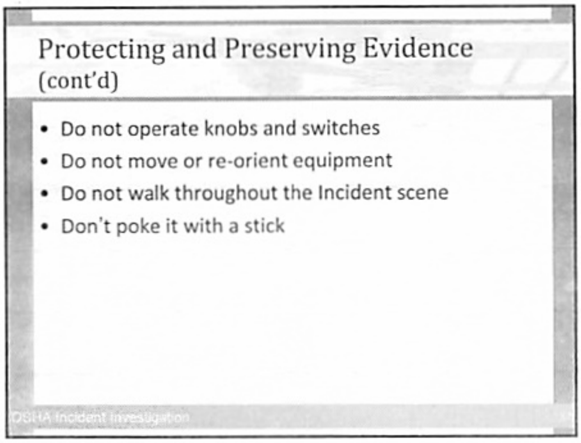
The Importance of Evidence

- Orientation of equipment and position of controls
- Weather and time can dilute accelerants and dissolve skid marks
- Moving items can have the same effect as destroying evidence
- Root cause of an Incident is seldom know early
- Strategic importance of a piece of evidence may not be realized until the end of the investigation



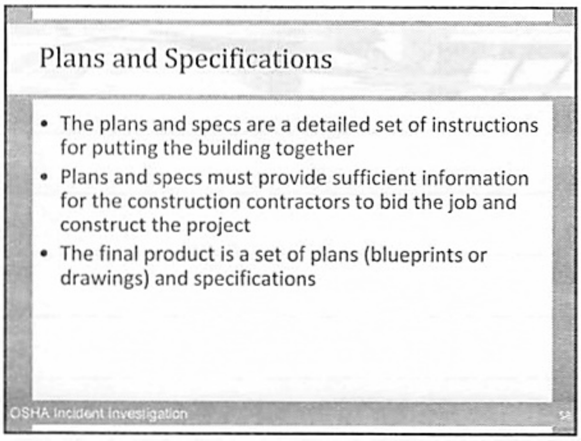
Incident Scene Responsibility

- Responsibility for the preservation of the Incident scene must be determined as soon as possible, such as when phone call comes into the office
- Have local Authority or Employer secure the scene until arrival, if possible
- Lack of preservation will likely result in the loss of physical evidence



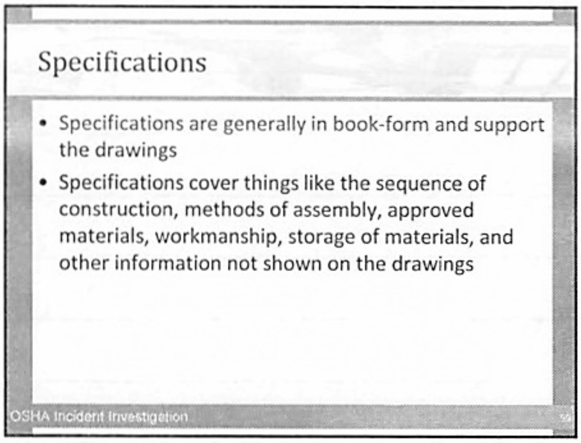
Protecting and Preserving Evidence (cont'd)

- Do not operate knobs and switches
- Do not move or re-orient equipment
- Do not walk throughout the Incident scene
- Don't poke it with a stick



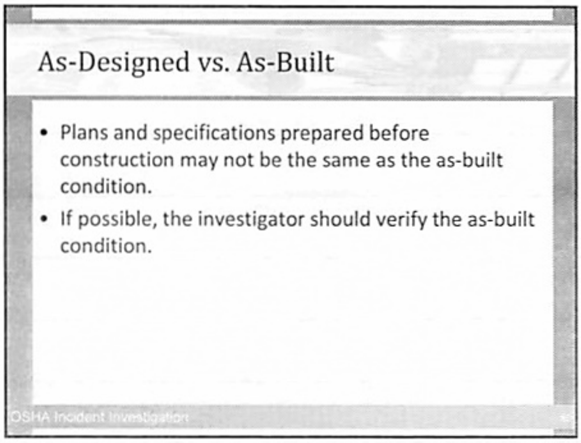
Plans and Specifications

- The plans and specs are a detailed set of instructions for putting the building together
- Plans and specs must provide sufficient information for the construction contractors to bid the job and construct the project
- The final product is a set of plans (blueprints or drawings) and specifications



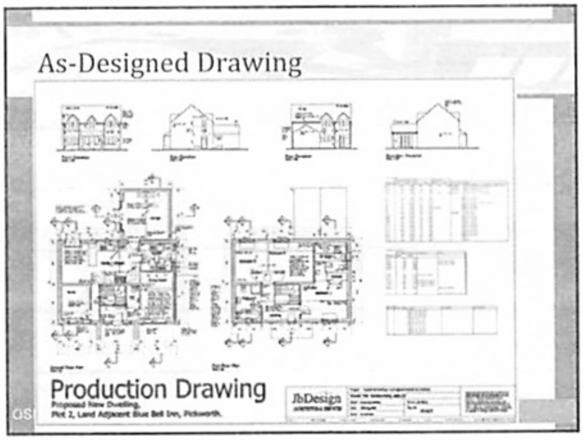
Specifications

- Specifications are generally in book-form and support the drawings
- Specifications cover things like the sequence of construction, methods of assembly, approved materials, workmanship, storage of materials, and other information not shown on the drawings



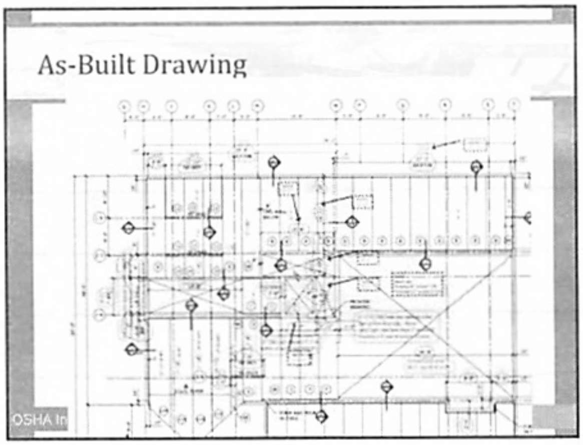
As-Designed vs. As-Built

- Plans and specifications prepared before construction may not be the same as the as-built condition.
- If possible, the investigator should verify the as-built condition.

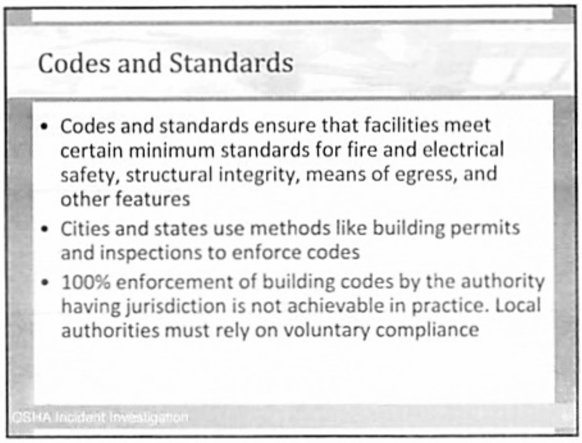


As-Designed Drawing

Production Drawing
Proposed New Dwelling,
Plot 2, Land Adjacent Blue Bell Inn, Pickworth.
JbDesign

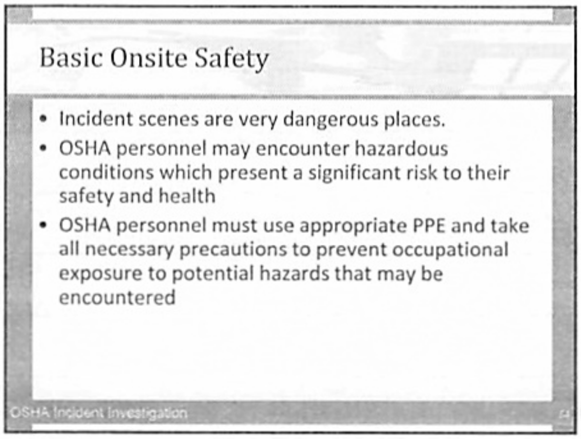


As-Built Drawing



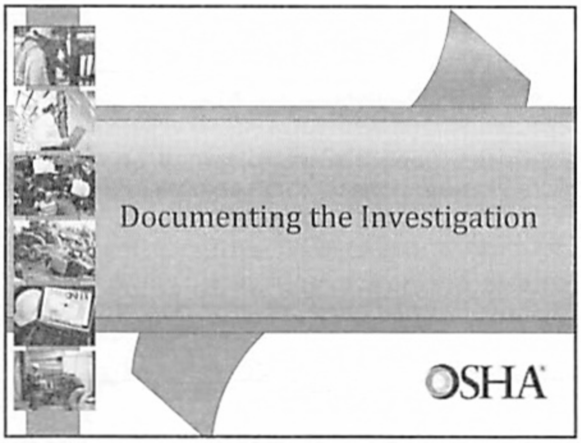
Codes and Standards

- Codes and standards ensure that facilities meet certain minimum standards for fire and electrical safety, structural integrity, means of egress, and other features
- Cities and states use methods like building permits and inspections to enforce codes
- 100% enforcement of building codes by the authority having jurisdiction is not achievable in practice. Local authorities must rely on voluntary compliance



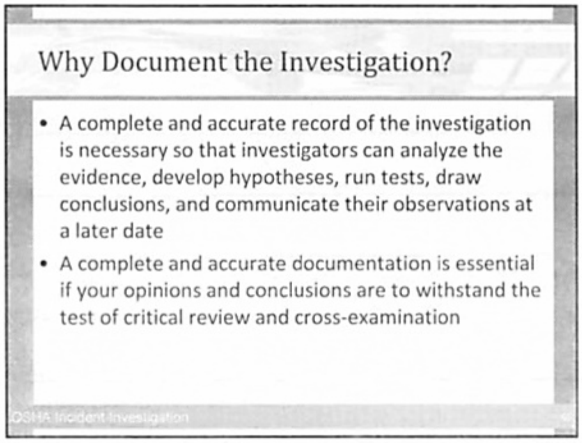
Basic Onsite Safety

- Incident scenes are very dangerous places.
- OSHA personnel may encounter hazardous conditions which present a significant risk to their safety and health
- OSHA personnel must use appropriate PPE and take all necessary precautions to prevent occupational exposure to potential hazards that may be encountered



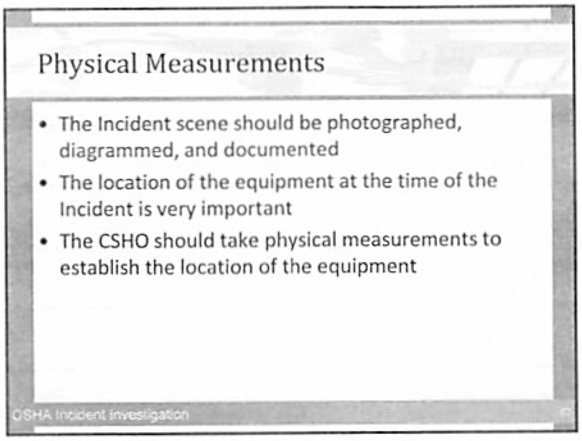
Documenting the Investigation

OSHA



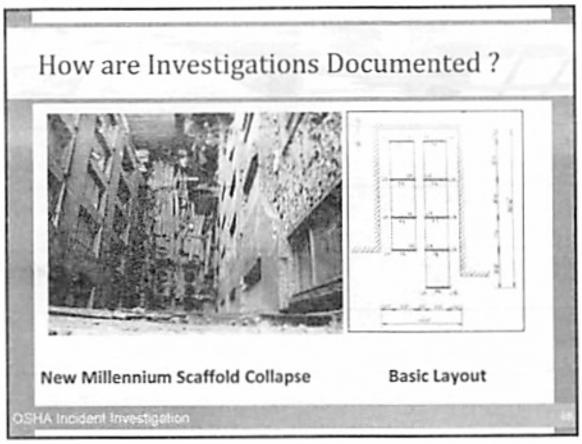
Why Document the Investigation?

- A complete and accurate record of the investigation is necessary so that investigators can analyze the evidence, develop hypotheses, run tests, draw conclusions, and communicate their observations at a later date
- A complete and accurate documentation is essential if your opinions and conclusions are to withstand the test of critical review and cross-examination



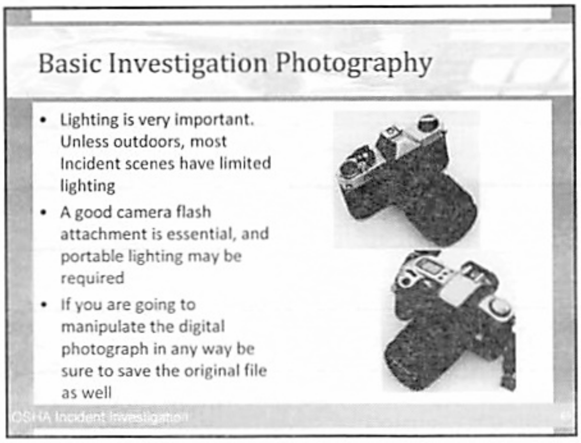
Physical Measurements

- The Incident scene should be photographed, diagrammed, and documented
- The location of the equipment at the time of the Incident is very important
- The CSHO should take physical measurements to establish the location of the equipment



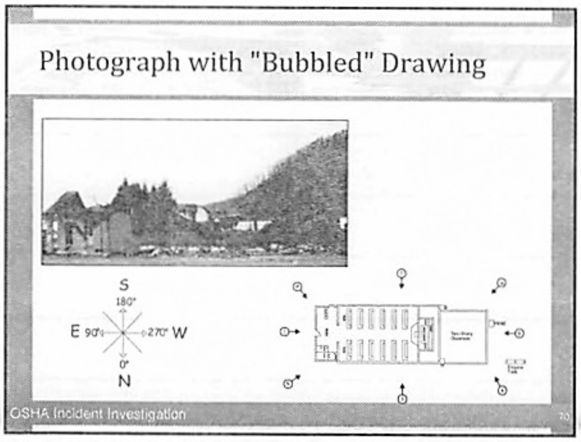
How are Investigations Documented ?

New Millennium Scaffold Collapse **Basic Layout**



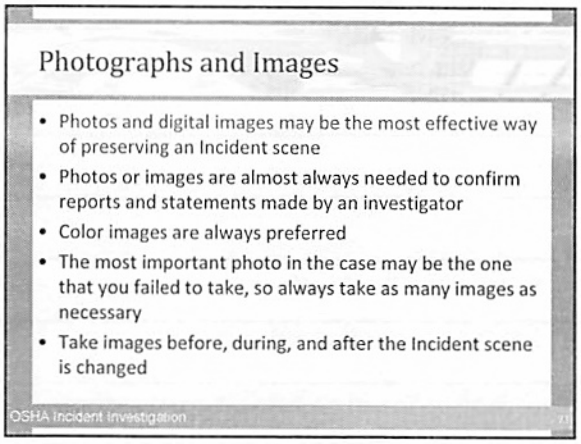
Basic Investigation Photography

- Lighting is very important. Unless outdoors, most Incident scenes have limited lighting
- A good camera flash attachment is essential, and portable lighting may be required
- If you are going to manipulate the digital photograph in any way be sure to save the original file as well



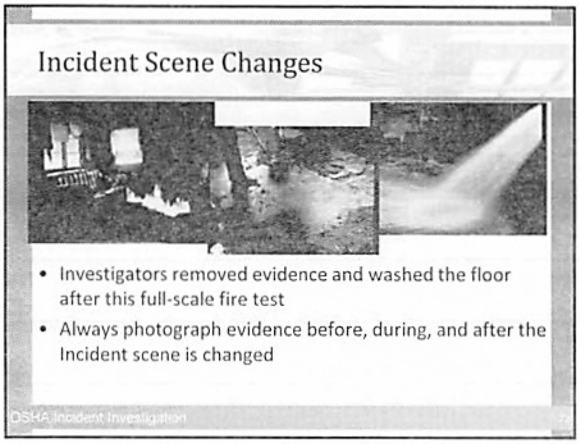
Photograph with "Bubbled" Drawing

S
180°
E 90°
270° W
0°
N



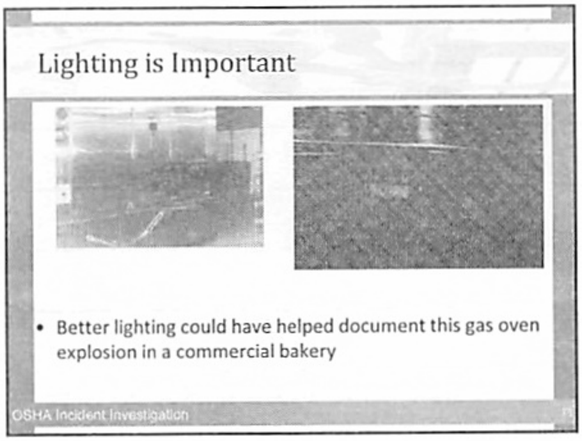
Photographs and Images

- Photos and digital images may be the most effective way of preserving an Incident scene
- Photos or images are almost always needed to confirm reports and statements made by an investigator
- Color images are always preferred
- The most important photo in the case may be the one that you failed to take, so always take as many images as necessary
- Take images before, during, and after the Incident scene is changed



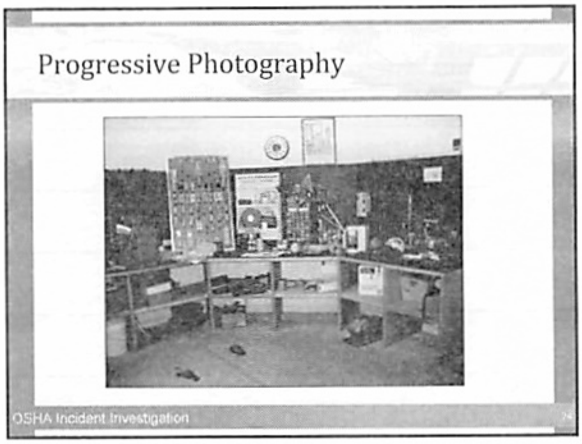
Incident Scene Changes

- Investigators removed evidence and washed the floor after this full-scale fire test
- Always photograph evidence before, during, and after the Incident scene is changed

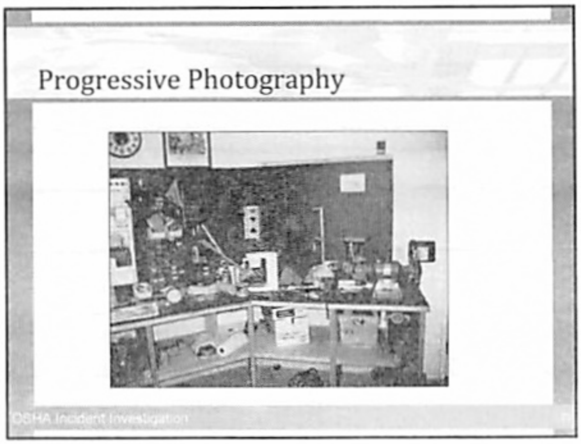


Lighting is Important

- Better lighting could have helped document this gas oven explosion in a commercial bakery

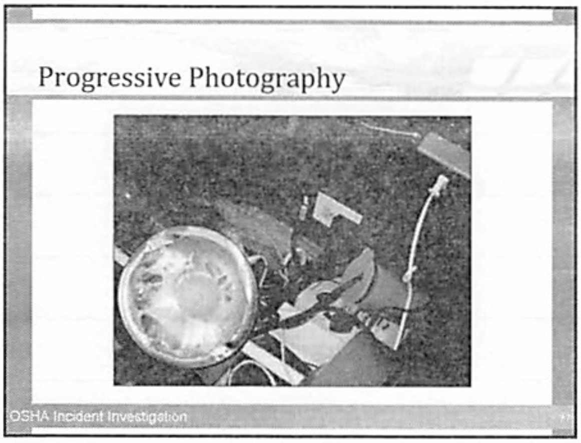


Progressive Photography

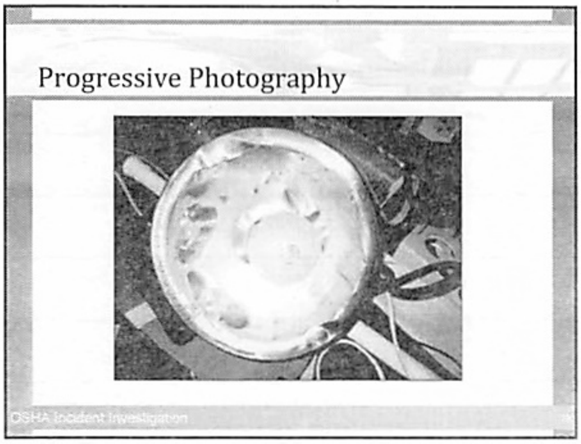


Progressive Photography

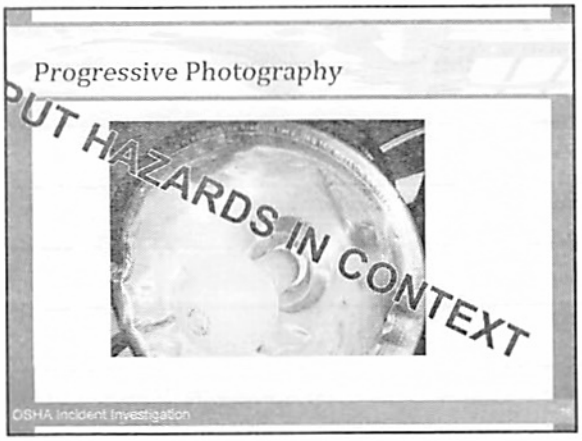
Progressive Photography



Progressive Photography

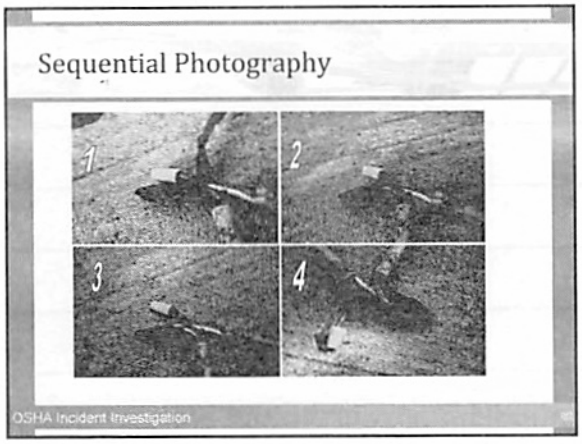


Progressive Photography

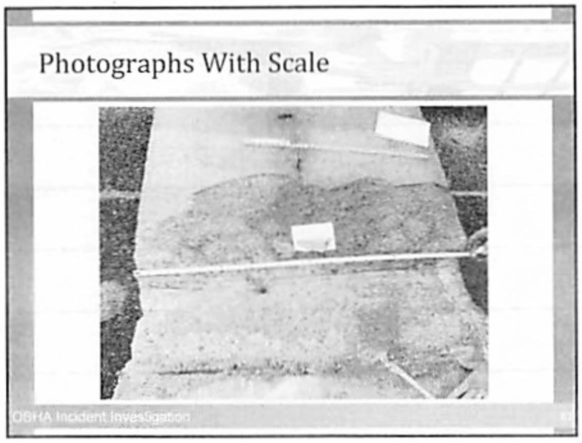


Progressive Photography

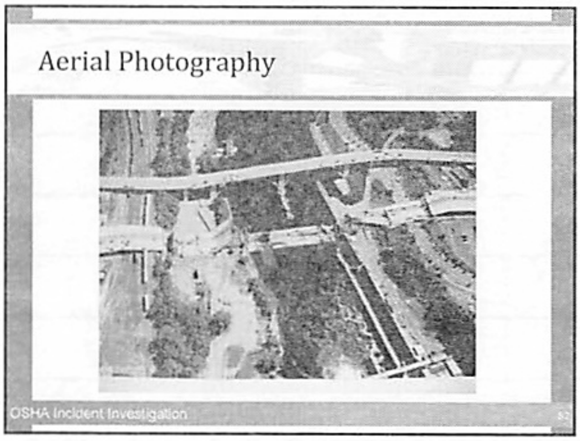
PUT HAZARDS IN CONTEXT



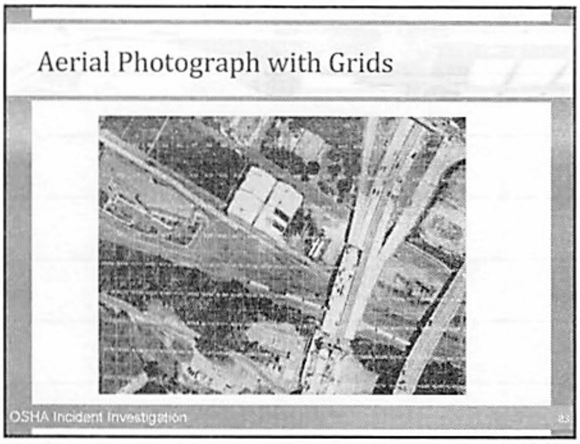
Sequential Photography



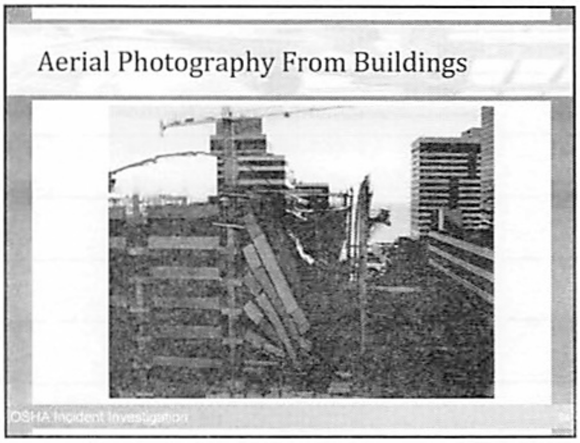
Photographs With Scale



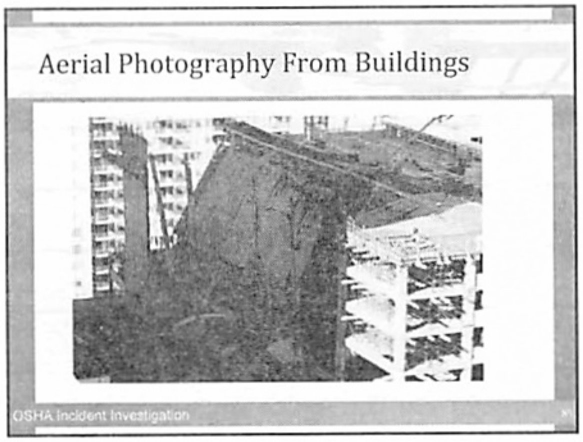
Aerial Photography



Aerial Photograph with Grids

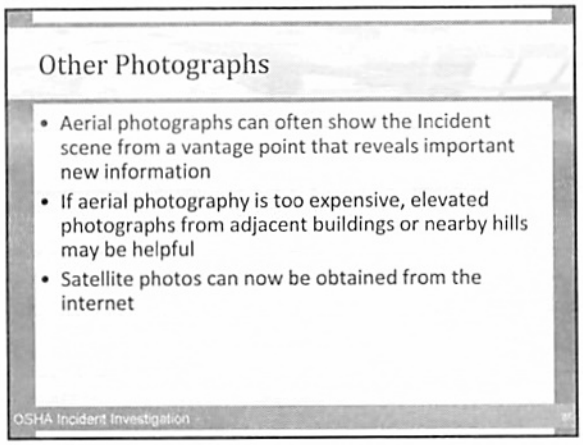


Aerial Photography From Buildings



Aerial Photography From Buildings

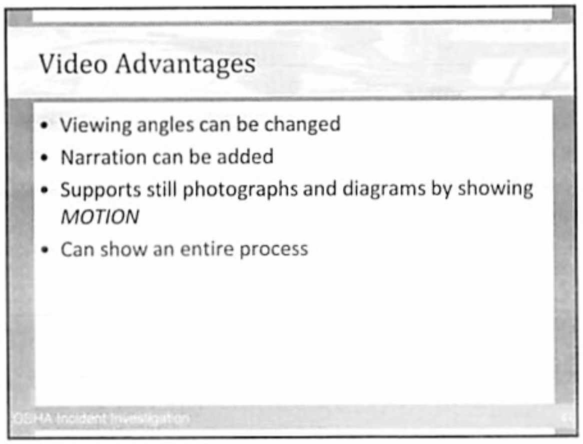
OSHA Incident Investigation



Other Photographs

- Aerial photographs can often show the Incident scene from a vantage point that reveals important new information
- If aerial photography is too expensive, elevated photographs from adjacent buildings or nearby hills may be helpful
- Satellite photos can now be obtained from the internet

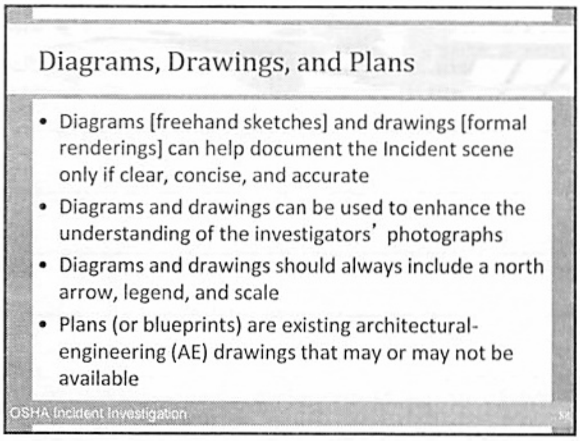
OSHA Incident Investigation



Video Advantages

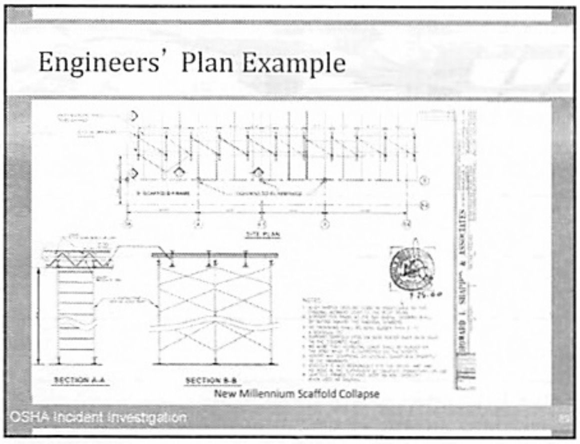
- Viewing angles can be changed
- Narration can be added
- Supports still photographs and diagrams by showing *MOTION*
- Can show an entire process

OSHA Incident Investigation



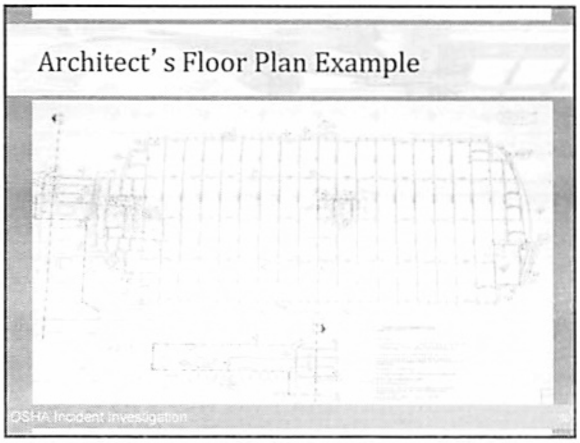
Diagrams, Drawings, and Plans

- Diagrams [freehand sketches] and drawings [formal renderings] can help document the Incident scene only if clear, concise, and accurate
- Diagrams and drawings can be used to enhance the understanding of the investigators' photographs
- Diagrams and drawings should always include a north arrow, legend, and scale
- Plans (or blueprints) are existing architectural-engineering (AE) drawings that may or may not be available

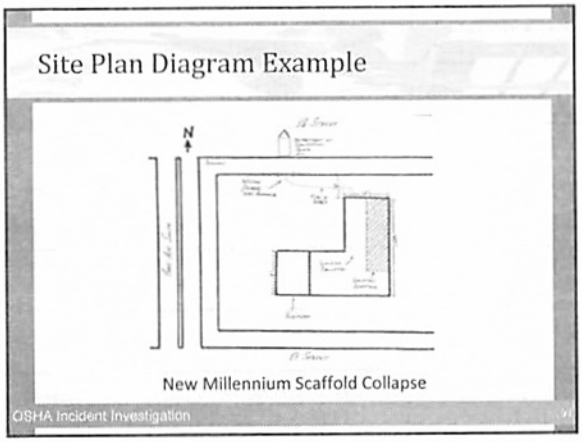


Engineers' Plan Example

New Millennium Scaffold Collapse



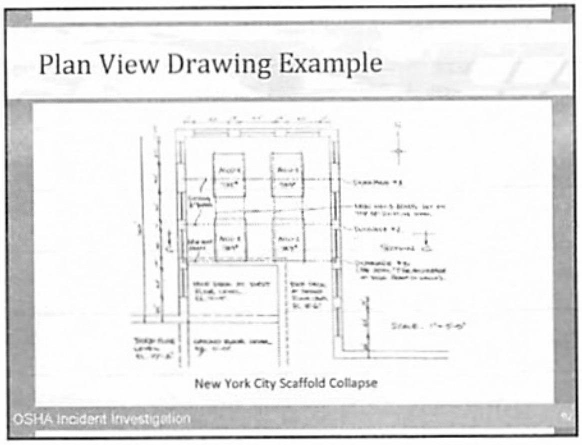
Architect's Floor Plan Example



Site Plan Diagram Example

New Millennium Scaffold Collapse

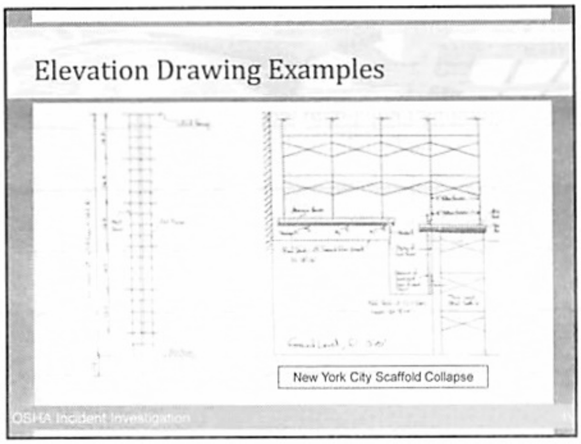
OSHA Incident Investigation



Plan View Drawing Example

New York City Scaffold Collapse

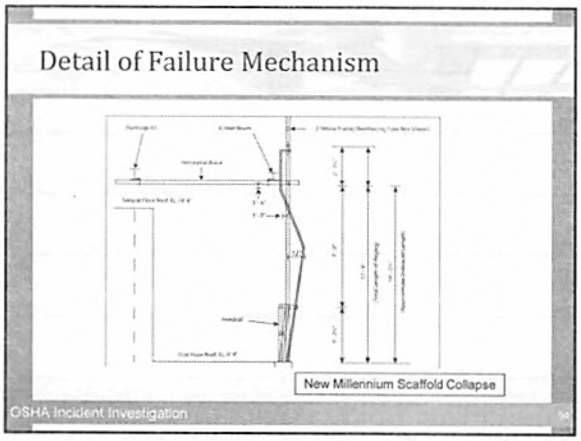
OSHA Incident Investigation



Elevation Drawing Examples

New York City Scaffold Collapse

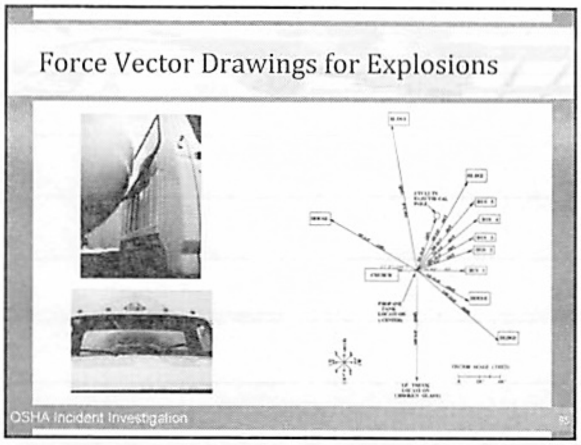
OSHA Incident Investigation



Detail of Failure Mechanism

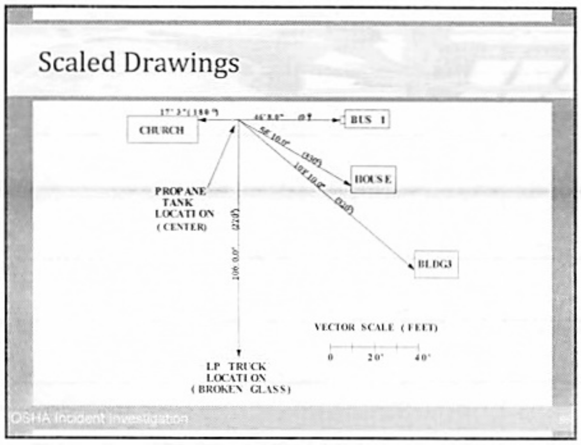
New Millennium Scaffold Collapse

OSHA Incident Investigation



Force Vector Drawings for Explosions

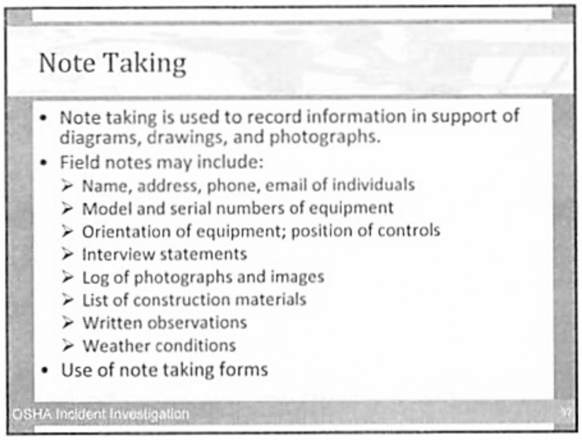
OSHA Incident Investigation



Scaled Drawings

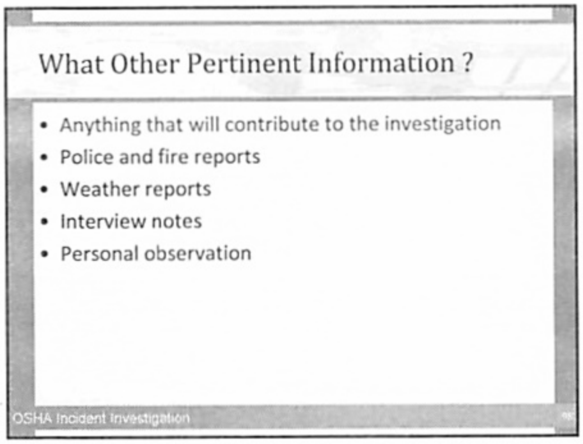
17' 3" (180°)
CHURCH
46' 8.0"
(0°)
BUS 1
58' 10.0"
(330°)
HOUSE
103' 10.0"
(320°)
BLDG3
PROPANE TANK LOCATION (CENTER)
106' 0.0"
(270°)
LP TRUCK LOCATION (BROKEN GLASS)
VECTOR SCALE (FEET)
0
20'
40'

OSHA Incident Investigation



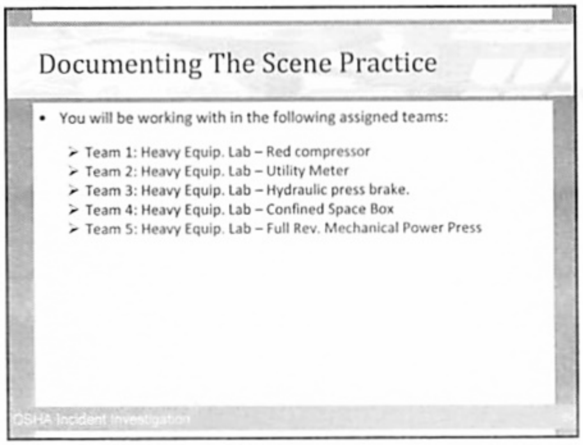
Note Taking

- Note taking is used to record information in support of diagrams, drawings, and photographs.
- Field notes may include:
  - ➢ Name, address, phone, email of individuals
  - ➢ Model and serial numbers of equipment
  - ➢ Orientation of equipment; position of controls
  - ➢ Interview statements
  - ➢ Log of photographs and images
  - ➢ List of construction materials
  - ➢ Written observations
  - ➢ Weather conditions
- Use of note taking forms



What Other Pertinent Information ?

- Anything that will contribute to the investigation
- Police and fire reports
- Weather reports
- Interview notes
- Personal observation



Documenting The Scene Practice

- You will be working with in the following assigned teams:
  - ➢ Team 1: Heavy Equip. Lab – Red compressor
  - ➢ Team 2: Heavy Equip. Lab – Utility Meter
  - ➢ Team 3: Heavy Equip. Lab – Hydraulic press brake.
  - ➢ Team 4: Heavy Equip. Lab – Confined Space Box
  - ➢ Team 5: Heavy Equip. Lab – Full Rev. Mechanical Power Press

Field Practice: *On-Site Investigation*

Student Instructions

Purpose: To develop collecting and documenting physical evidence on an incident scene.

Instructions

1. For this practice, you will be assigned to a work group by your instructor. Your group will receive:
    a. Un-Programmed Activity
    b. Camera
    c. Tape Measure
    d. Clip Board with Paper.
2. Your group will proceed to the heavy equipment lab.
3. Your group will proceed to one of the five incident scenes.
4. Your group will document the scene of the incident using various on-site investigative techniques. (Photos and drawing).
5. The Instructor will have each table report out. Please note that although you may assign a spokesperson, the instructor reserves the right to ask questions of each person within the group.
6. Be sure to consult with your instructor, if you have any questions or require additional clarification.

U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

Reporting ID		Previous Activity(Type & Number)	13463	Referral Number	34980	
Establishment Information	Establishment Name	Sparky's Shocker	Employer ID	845090		
	Site Address		City Code	096	County Code	4444
		Site Phone	(847) 989-2233	Site Fax	(847) 325-8866	
	Mailing Address	699 Tinker Way Arlington Heights, IL				
	Event Address	2020 S. Arlington Heights Rd, Arlington Heights, IL				
Industry & Ownership	Type of Business	Electrical	Primary SIC	1731	No. of Employees	22
	Ownership	Steven Laser				
Receipt Information	Reported By	CSHO	Date	08-15-15	Time	9:00am
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	08-15-15	8:00 am	0	1	0	0
	Type of Event	Arc Flash				
Preliminary Description	Employee suffered 3rd degree burns from an arc flash event, while removing fuse from disconnect switch.					
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis						
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments	All electrical power has been de-energized and lock out/tag-out					

U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

Reporting ID		Previous Activity(Type & Number)	13463	Referral Number	34980	
Establishment Information	Establishment Name	U Press it Inc.		Employer ID	845090	
	Site Address		City Code	096	County Code	4444
		Site Phone	(847) 636-7766	Site Fax	(847) 636-8899	
	Mailing Address	368 Fox Sedge Drive Crystal, IL				
	Event Address					
Industry & Ownership	Type of Business	Fabricated Metal Products	Primary SIC	341100	No. of Employees	22
	Ownership	Timothy Small				
Receipt Information	Reported By	CSHO	Date	08-15-15	Time	12:30pm
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	08-15-15	8:00 am	0	1	0	0
	Type of Event	Amputation				
Preliminary Description	Employee's right hand was amputated in a full revolution mechanical power press, while fabricating metal boxes.					
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis	Amputations					
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments	Full revolution mechanical power press is shut down and secured by employer.					

U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

Reporting ID		Previous Activity(Type & Number)	12344	Referral Number	44321	
Establishment Information	Establishment Name	Wollas Construction, Inc.		Employer ID	989898	
	Site Address			City Code	093	County Code 0444
		Site Phone (847)555-1234	Site Fax (847)555-4321			
	Mailing Address	4012 Elm Street				
	Event Address					
Industry & Ownership	Type of Business	Underground Construction	Primary SIC	162303	No. of Employees	13
	Ownership	William Wollas				
Receipt Information	Reported By	CSHO	Date	01-01-2015	Time	12:09
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	01-01-2015	10:03	1	1	2	0
	Type of Event					
Preliminary Description	Employees were working in a vault to cut and cap a water line with a partner saw and were overcome by carbon monoxide. One employee was hospitalized and shortly after being admitted died.					
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis						
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments	Fire Department stated they was an electric saw found outside vault and a gas partner saw found inside the vault.					

U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

Reporting ID		Previous Activity(Type & Number)	24598	Referral Number	989876	
Establishment Information	Establishment Name	XYZ Presser INC.		Employer ID	76423	
	Site Address		City Code	096	County Code	4444
		Site Phone	(847) 853-2211	Site Fax	(847) 853-0099	
	Mailing Address	222 Water Leaf Lane Rockton, IL				
	Event Address	2020 S. Arlington Heights RD Arlington Heights, IL				
Industry & Ownership	Type of Business	Fabricated Metal Products	Primary SIC	341100	No. of Employees	30
	Ownership	Josh Brigton				
Receipt Information	Reported By	CSHO	Date	09-15-15	Time	11:30 am
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	09-15-15	8:00 am	0	1	0	0
	Type of Event	Amputation				
Preliminary Description	Employee's right three fingers were amputated in a Hydraulic Press Break, while making a metal box.					
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis	Amputations					
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments	Hydraulic Press Brake has been shut down and secured by employer.					

U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

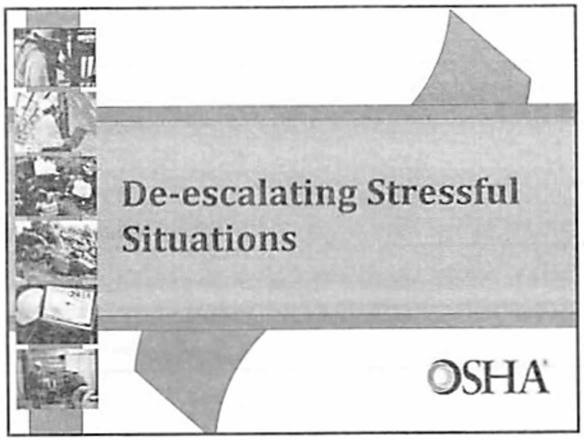
Reporting ID		Previous Activity(Type & Number)	12356	Referral Number	44389	
Establishment Information	Establishment Name	Orange Compressors		Employer ID	909222	
	Site Address	1405 Chapel Rd		City Code	093	County Code 0444
		Site Phone (847)555-1234	Site Fax (847)555-4321			
	Mailing Address	569 Homes Way Rockton, IL				
	Event Address					
Industry & Ownership	Type of Business	Paper Mill	Primary SIC	2621	No. of Employees	30
	Ownership	Jim Johnson				
Receipt Information	Reported By	CSHO	Date	04-05-2015	Time	1:00pm
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	04-05-2015	10:03	1	1	2	0
	Type of Event	Struck-By				
Preliminary Description	Employees were preforming maintenance on a red air compressor, when the 2nd stage compressor exploded. Fatality injuring on employee and injuring two others.					
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis						
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments						

U.S. Department of Labor

Occupational Safety and Health

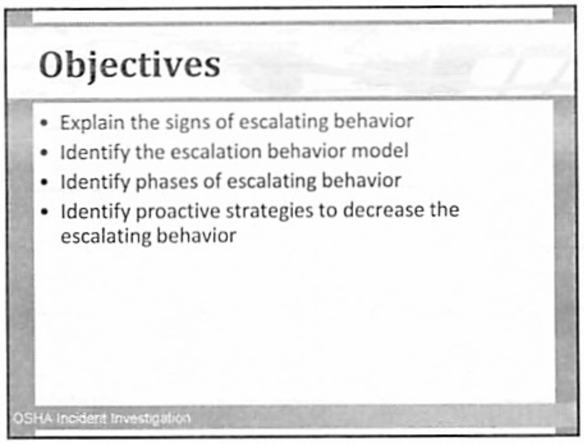
Un-Programmed Activity

Reporting ID		Previous Activity(Type & Number)		Referral Number		
Establishment Information	Establishment Name			Employer ID		
	Site Address			City Code		County Code
		Site Phone		Site Fax		
	Mailing Address					
	Event Address					
Industry & Ownership	Type of Business		Primary SIC		No. of Employees	
	Ownership					
Receipt Information	Reported By		Date		Time	
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	Type of Event					
Preliminary Description						
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis						
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments						



De-escalating Stressful Situations

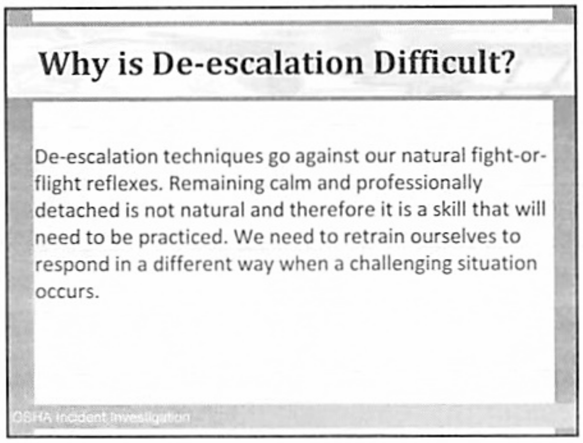
OSHA



Objectives

- Explain the signs of escalating behavior
- Identify the escalation behavior model
- Identify phases of escalating behavior
- Identify proactive strategies to decrease the escalating behavior

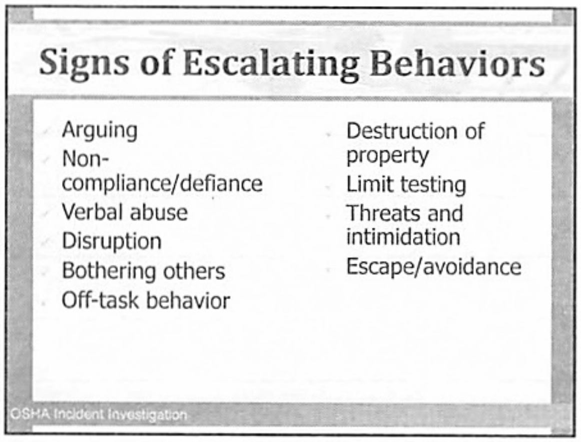
OSHA Incident Investigation



Why is De-escalation Difficult?

De-escalation techniques go against our natural fight-or-flight reflexes. Remaining calm and professionally detached is not natural and therefore it is a skill that will need to be practiced. We need to retrain ourselves to respond in a different way when a challenging situation occurs.

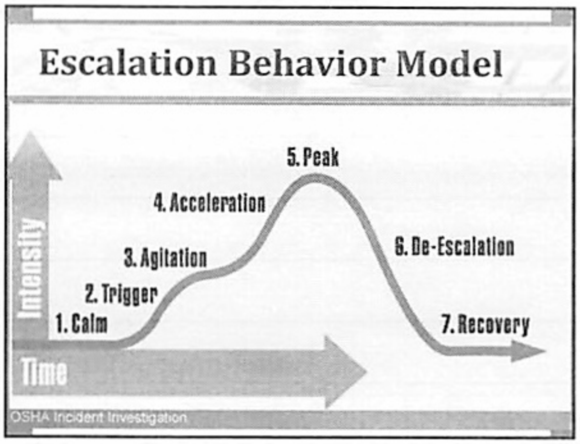
OSHA Incident Investigation



Signs of Escalating Behaviors

- Arguing
- Non-compliance/defiance
- Verbal abuse
- Disruption
- Bothering others
- Off-task behavior
- Destruction of property
- Limit testing
- Threats and intimidation
- Escape/avoidance

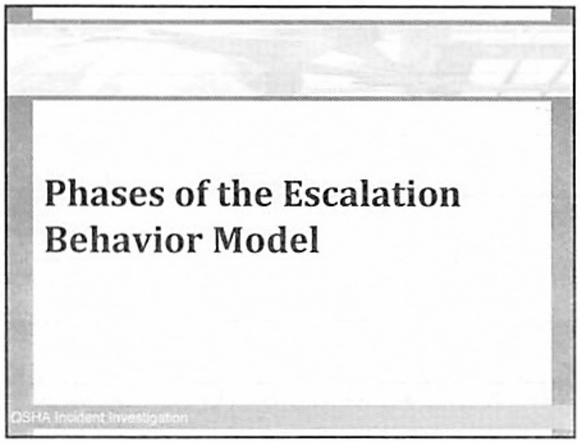
OSHA Incident Investigation



Escalation Behavior Model

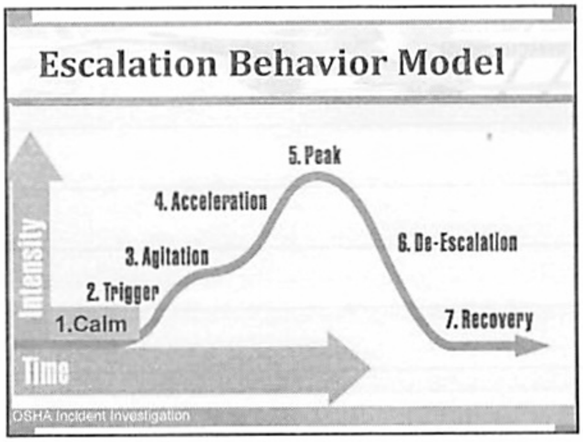
5. Peak
4. Acceleration
3. Agitation
6. De-Escalation
2. Trigger
1. Calm
7. Recovery
Intensity
Time

OSHA Incident Investigation



Phases of the Escalation Behavior Model

OSHA Incident Investigation



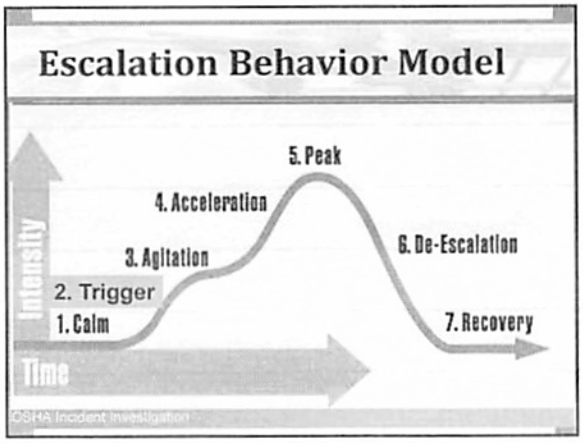
Escalation Behavior Model

5. Peak
4. Acceleration
3. Agitation
6. De-Escalation
2. Trigger
1.Calm
7. Recovery
Intensity
Time

Phase One- Calm

Person is cooperative.

- Accepts feedback
- Follows directives
- Answers questions
- Ignores distractions



Escalation Behavior Model

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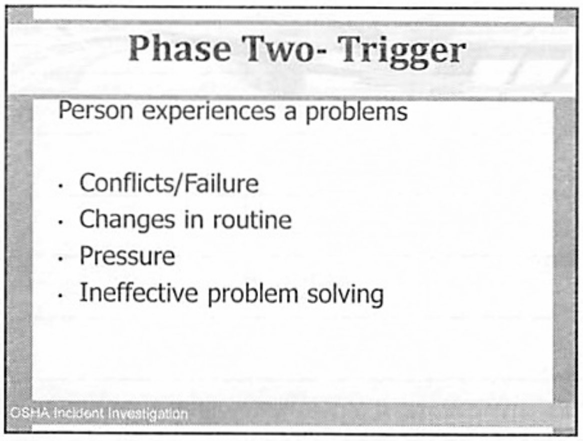
Intensity
Time

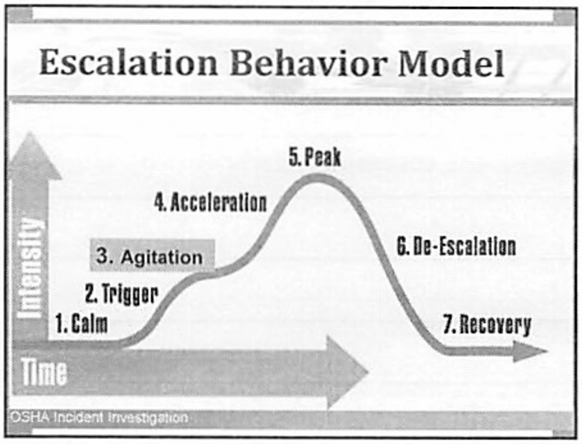


Phase Two- Trigger

Person experiences a problems

- Conflicts/Failure
- Changes in routine
- Pressure
- Ineffective problem solving

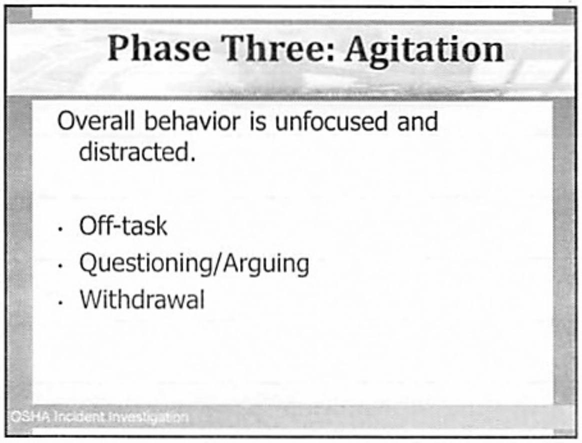
OSHA Incident Investigation



Escalation Behavior Model

Intensity
Time
1. Calm
2. Trigger
3. Agitation
4. Acceleration
5. Peak
6. De-Escalation
7. Recovery

OSHA Incident Investigation

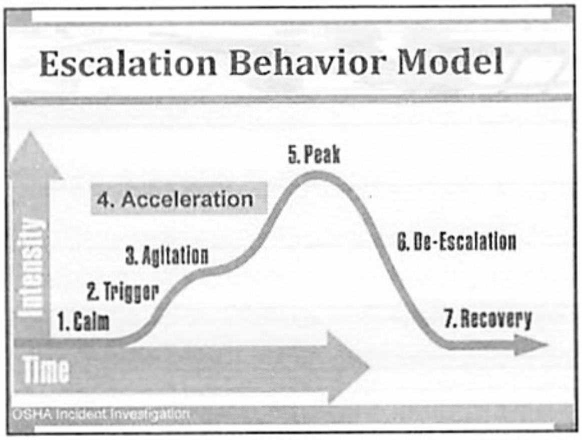


Phase Three: Agitation

Overall behavior is unfocused and distracted.

- Off-task
- Questioning/Arguing
- Withdrawal

OSHA Incident Investigation



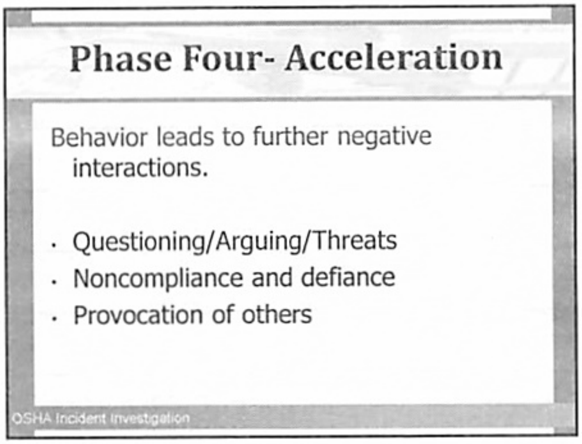
Escalation Behavior Model

Intensity

1. Calm
2. Trigger
3. Agitation
4. Acceleration
5. Peak
6. De-Escalation
7. Recovery

Time

OSHA Incident Investigation

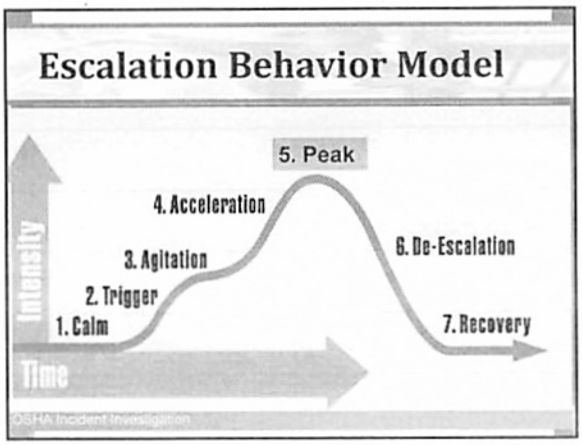


Phase Four- Acceleration

Behavior leads to further negative interactions.

- Questioning/Arguing/Threats
- Noncompliance and defiance
- Provocation of others

OSHA Incident Investigation



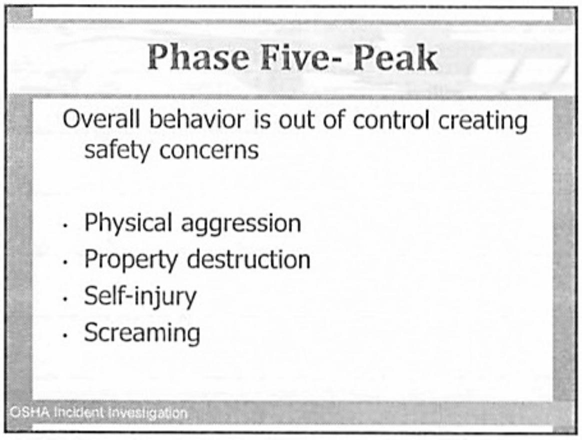
Escalation Behavior Model

Intensity

1. Calm
2. Trigger
3. Agitation
4. Acceleration
5. Peak
6. De-Escalation
7. Recovery

Time

OSHA Incident Investigation

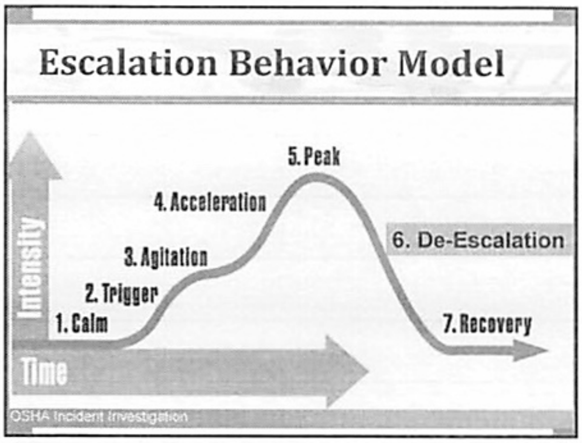


Phase Five- Peak

Overall behavior is out of control creating safety concerns

- Physical aggression
- Property destruction
- Self-injury
- Screaming

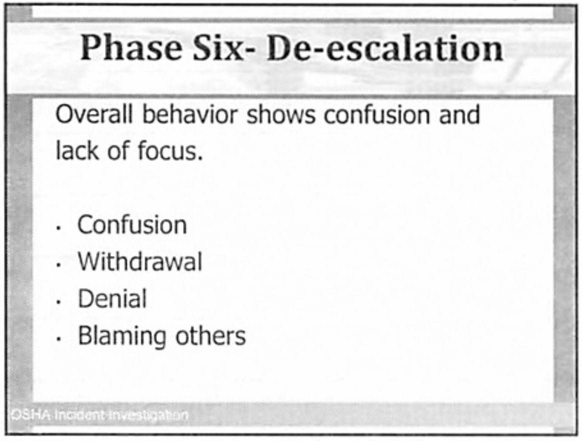
OSHA Incident Investigation



Escalation Behavior Model

Intensity
Time
1. Calm
2. Trigger
3. Agitation
4. Acceleration
5. Peak
6. De-Escalation
7. Recovery

OSHA Incident Investigation

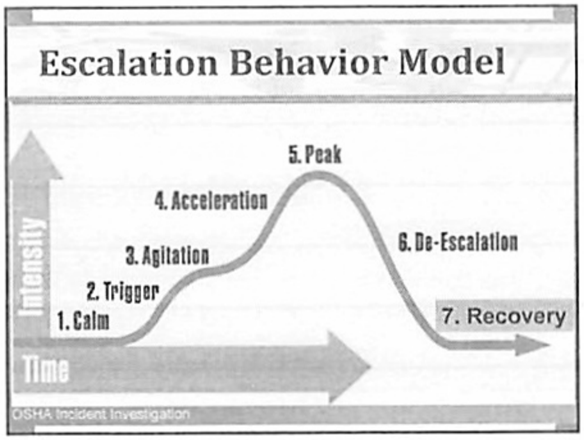


Phase Six- De-escalation

Overall behavior shows confusion and lack of focus.

- Confusion
- Withdrawal
- Denial
- Blaming others

OSHA Incident Investigation



Escalation Behavior Model

5. Peak
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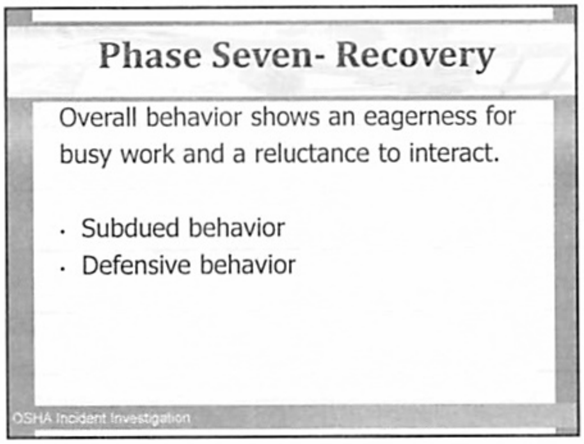
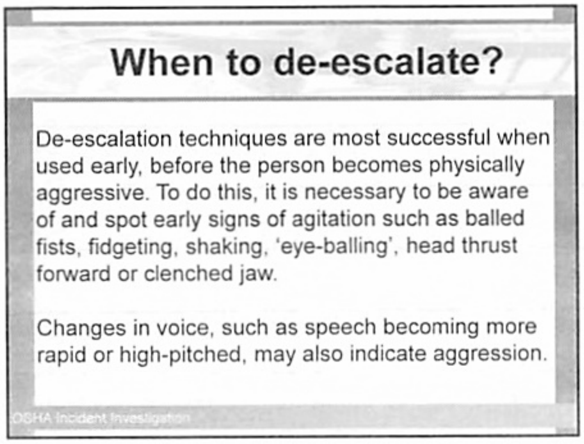
6. De-Escalation
3. Agitation
2. Trigger
1. Calm
7. Recovery
Intensity
Time



Phase Seven- Recovery

Overall behavior shows an eagerness for busy work and a reluctance to interact.

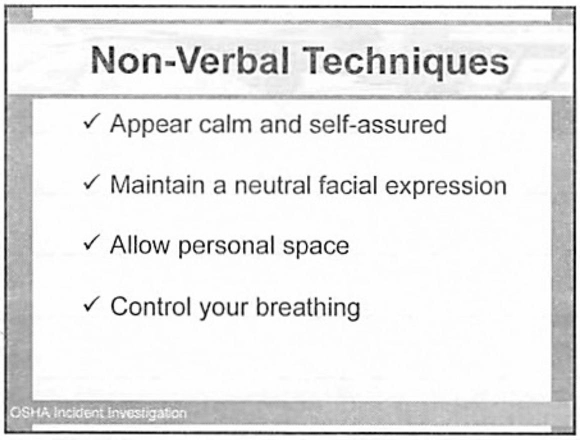
- Subdued behavior
- Defensive behavior



When to de-escalate?

De-escalation techniques are most successful when used early, before the person becomes physically aggressive. To do this, it is necessary to be aware of and spot early signs of agitation such as balled fists, fidgeting, shaking, 'eye-balling', head thrust forward or clenched jaw.

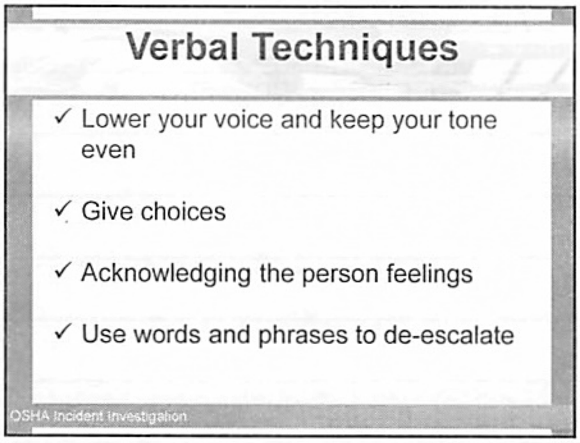
Changes in voice, such as speech becoming more rapid or high-pitched, may also indicate aggression.



Non-Verbal Techniques

- ✓ Appear calm and self-assured
- ✓ Maintain a neutral facial expression
- ✓ Allow personal space
- ✓ Control your breathing

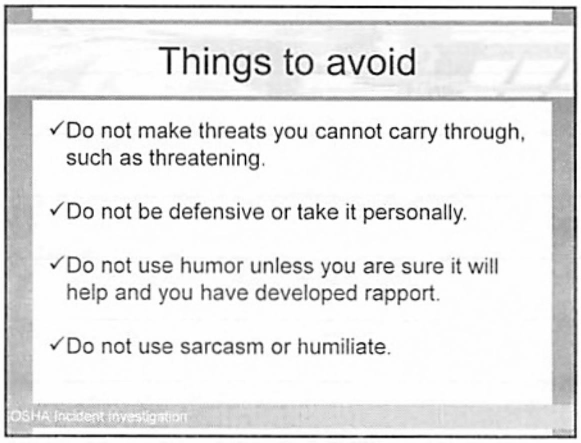
OSHA Incident Investigation



Verbal Techniques

- ✓ Lower your voice and keep your tone even
- ✓ Give choices
- ✓ Acknowledging the person feelings
- ✓ Use words and phrases to de-escalate

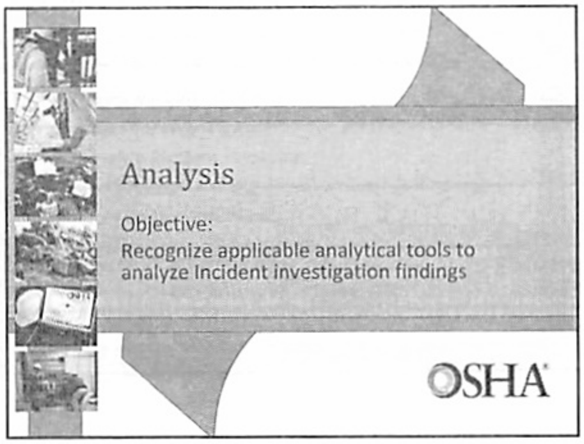
OSHA Incident Investigation



Things to avoid

- ✓Do not make threats you cannot carry through, such as threatening.
- ✓Do not be defensive or take it personally.
- ✓Do not use humor unless you are sure it will help and you have developed rapport.
- ✓Do not use sarcasm or humiliate.

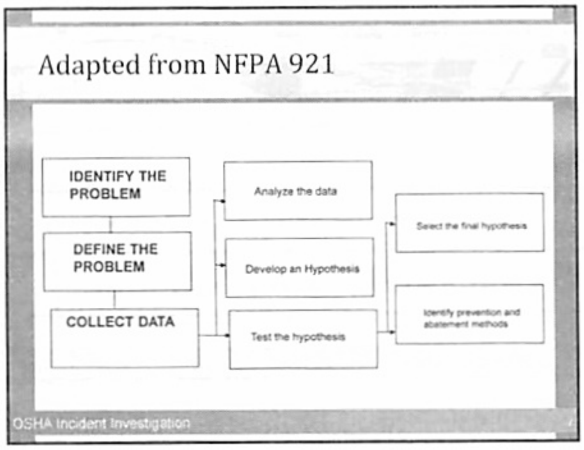
OSHA Incident Investigation



Analysis

Objective:
Recognize applicable analytical tools to analyze Incident investigation findings

OSHA



Adapted from NFPA 921

IDENTIFY THE PROBLEM

DEFINE THE PROBLEM

COLLECT DATA

Analyze the data

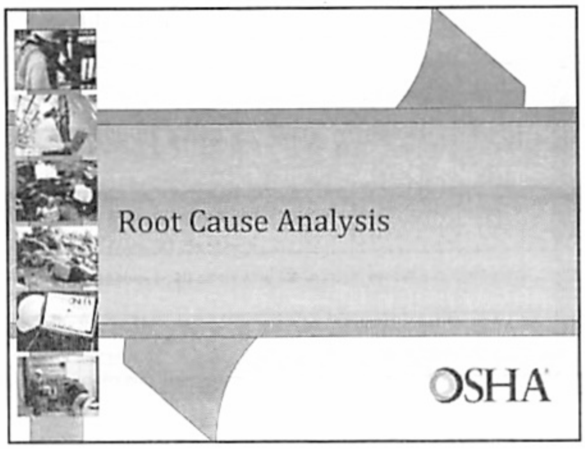
Develop an Hypothesis

Test the hypothesis

Select the final hypothesis

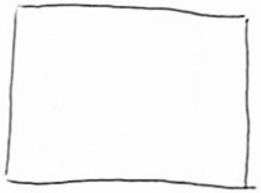
Identify prevention and abatement methods

OSHA Incident Investigation



Root Cause Analysis

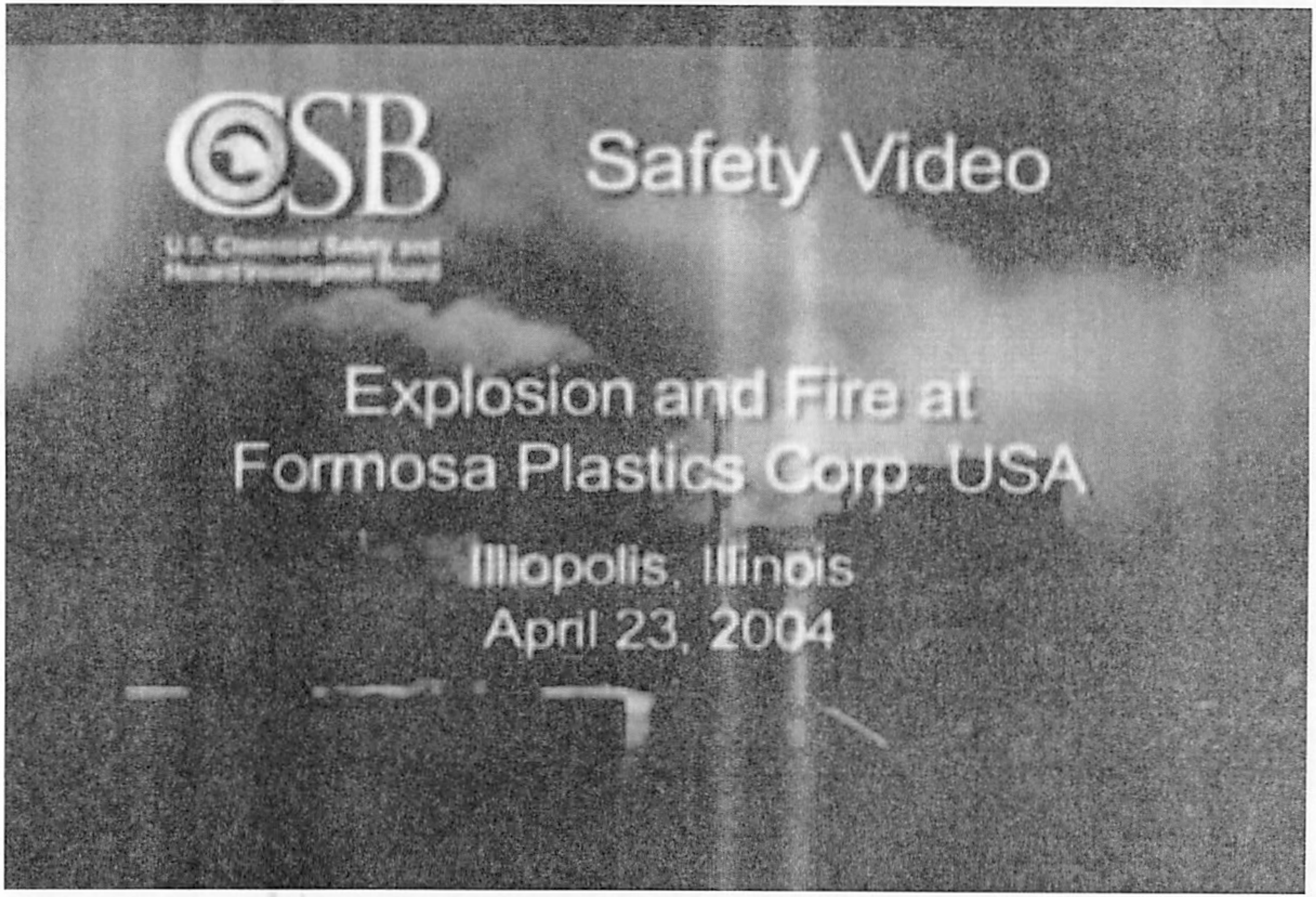
OSHA



Causal Factors Workshop

- On April 23, 2004, an explosion and fire killed five and injured three workers at the Formosa Plastics Corporation PVC manufacturing facility in Illiopolis, IL.
- The explosion occurred after a large quantity of vinyl chloride monomer (VCM) was inadvertently released from a reactor and ignited.
- VCM, a highly flammable chemical and a known carcinogen, is the primary raw material in PVC.
- The explosion and fire that followed destroyed much of the facility and burned for two days.
- Local authorities ordered residents within one mile of the facility to evacuate.

•U.S. Chemical Safety and Hazard Investigation Board Report No. 2004-10-I-IL, Mar 2007 - Vinyl Chloride Monomer Explosion, Illiopolis, IL, Apr 23, 2004.



CSB

U.S. Chemical Safety and Hazard Investigation Board

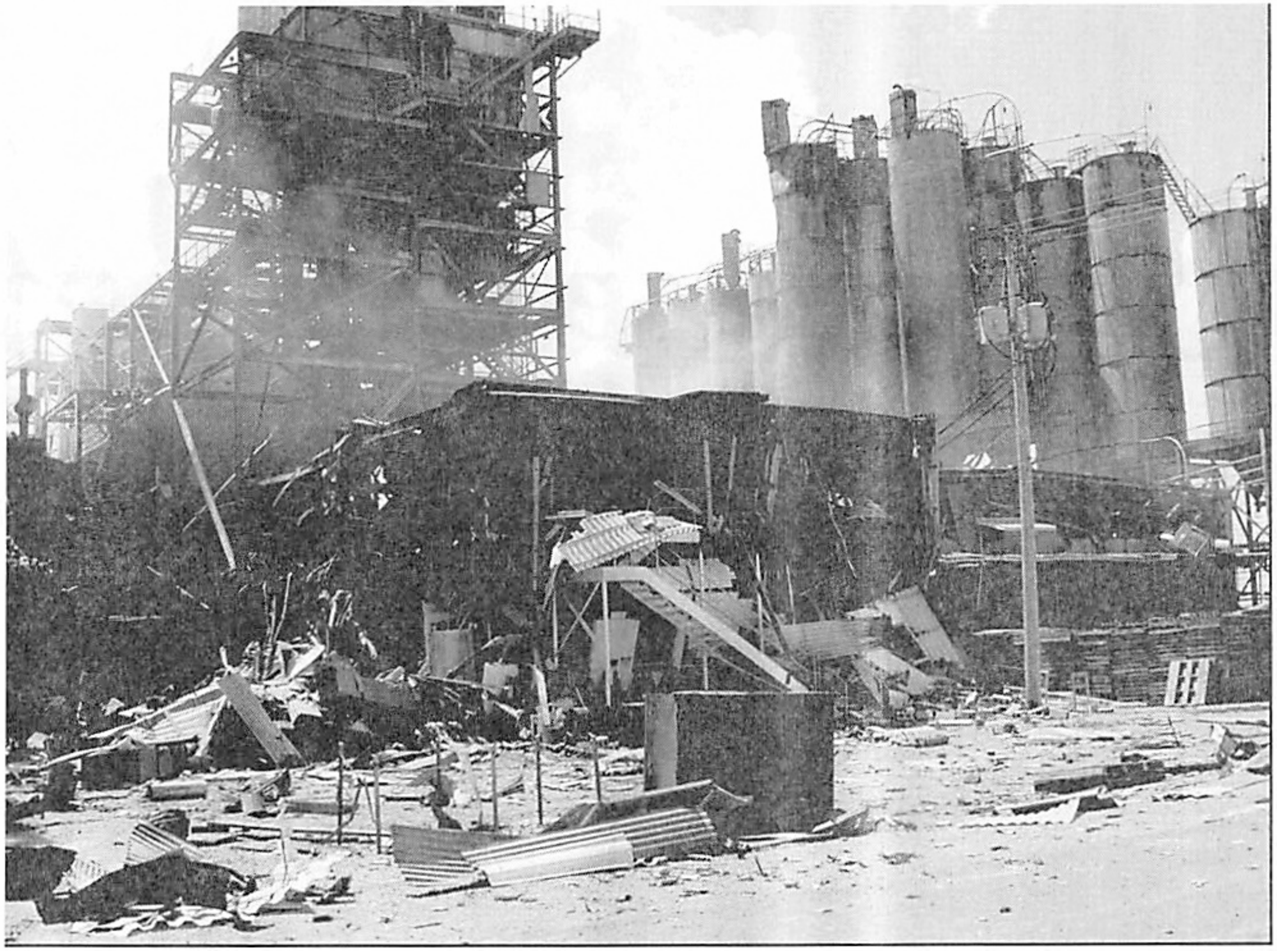
Safety Video

Explosion and Fire at Formosa Plastics Corp. USA

Illiopolis, Illinois

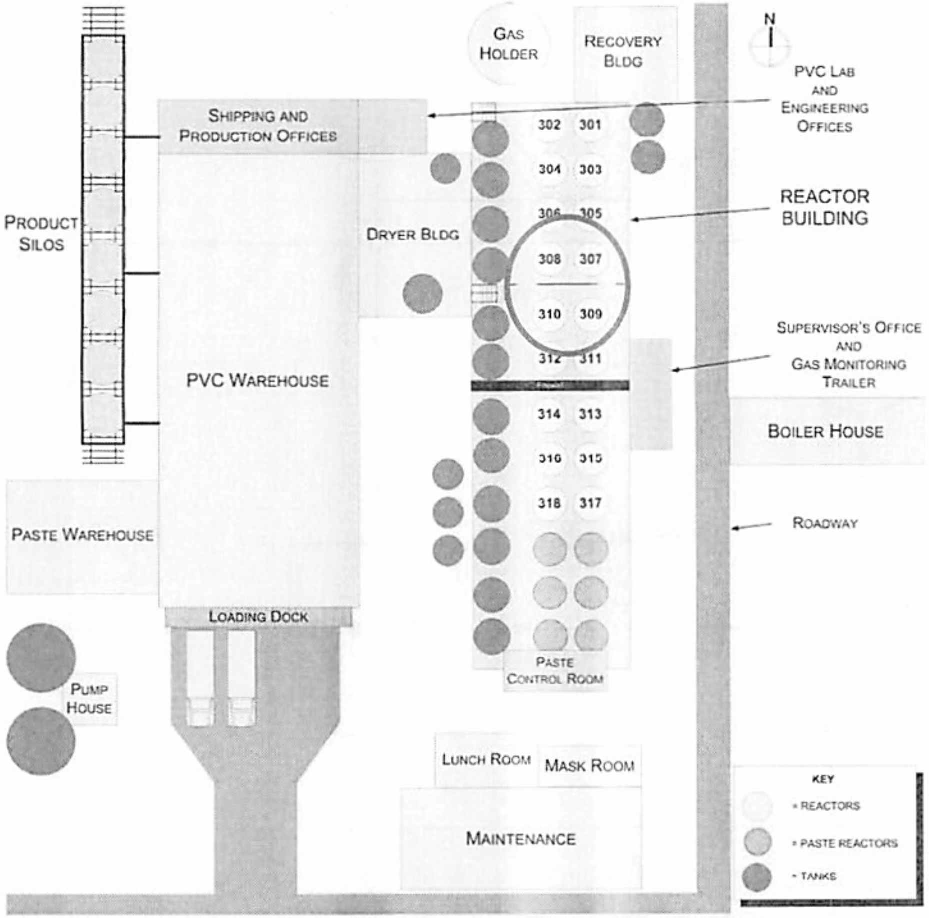
April 23, 2004

The Incident Scene



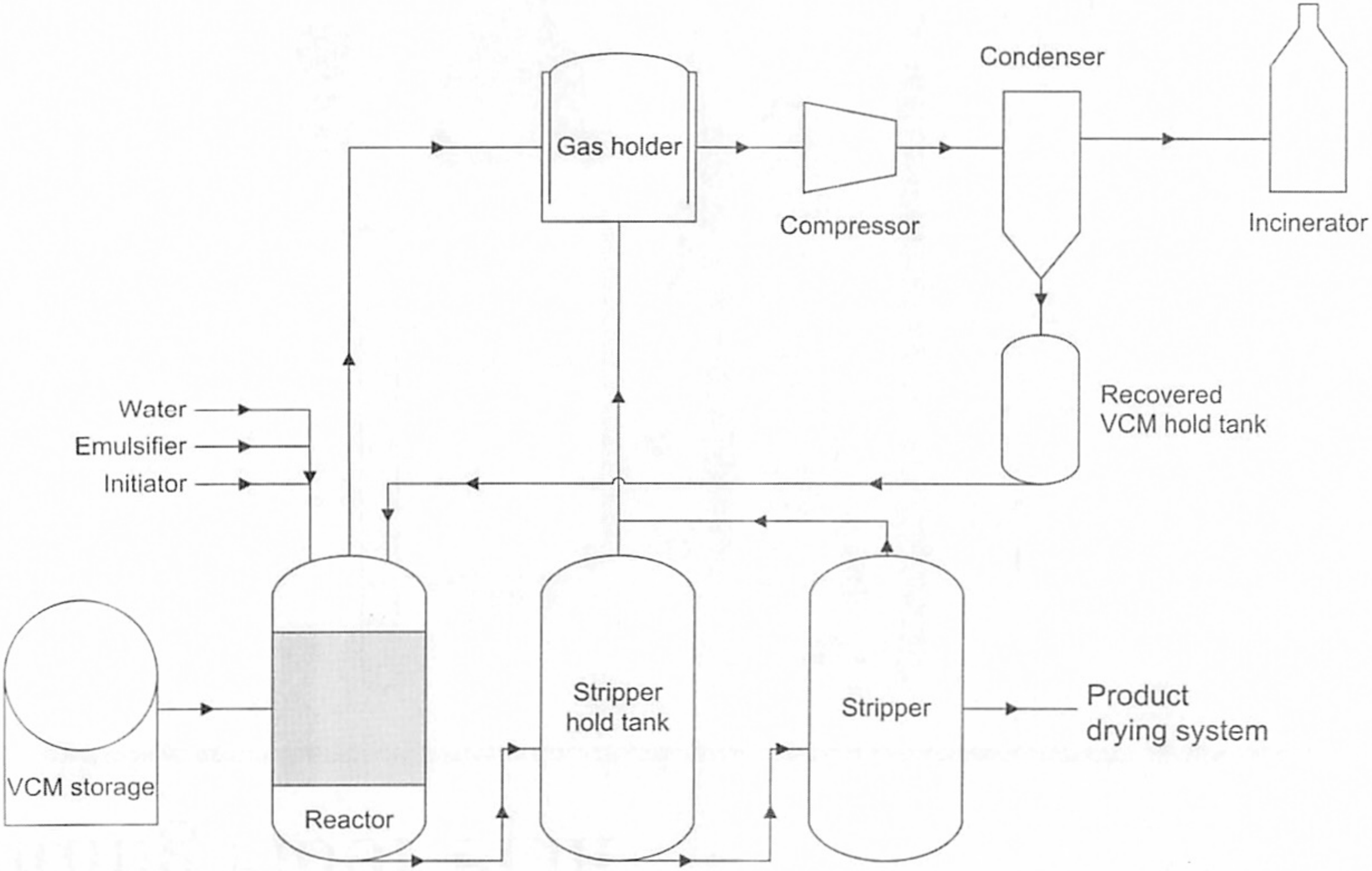
Start Casual Factor Chart

Building Floor Plan

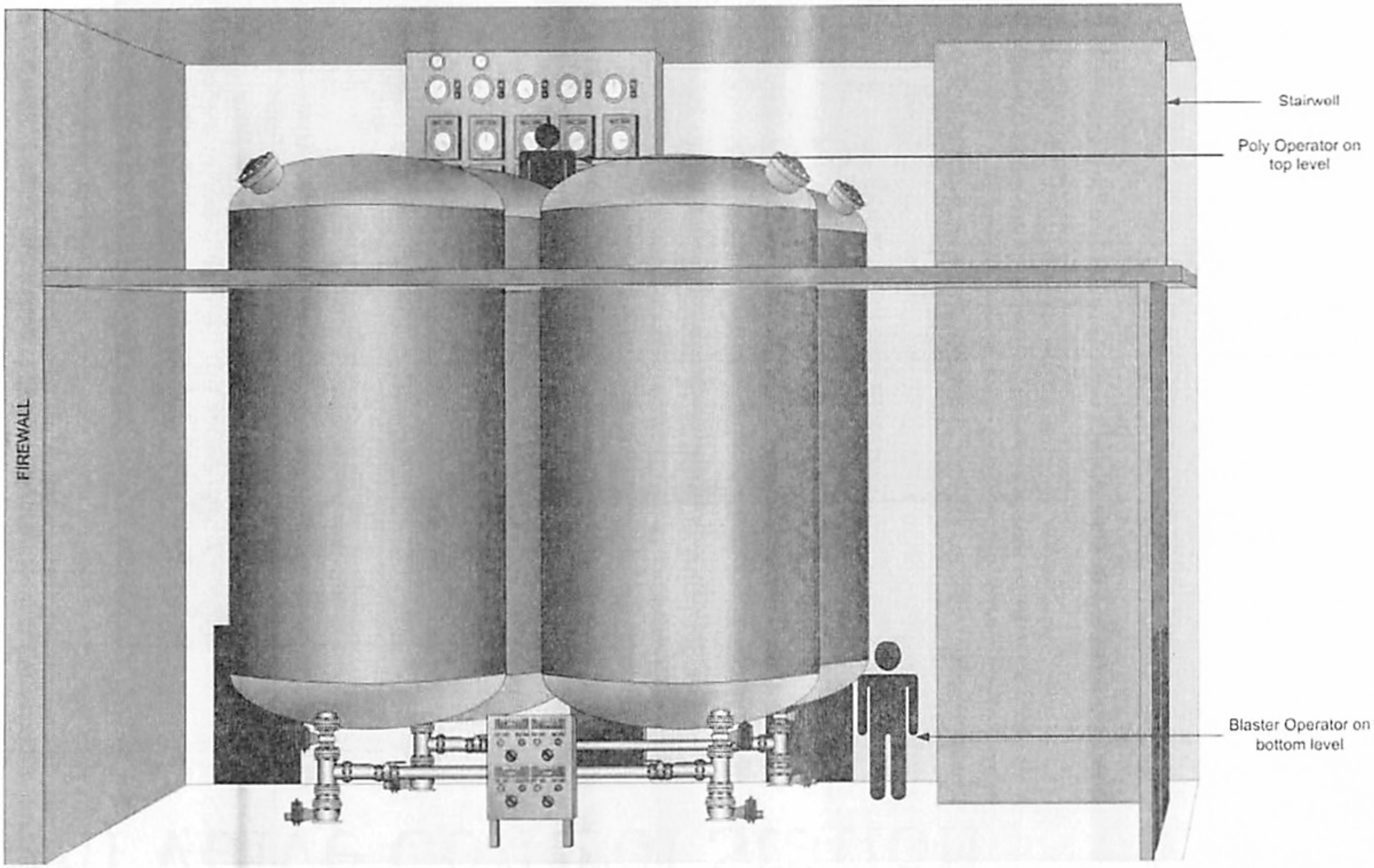


N
Gas Holder
Recovery Bldg
PVC Lab and Engineering Offices
Shipping and Production Offices
302
301
304
303
306
305
308
307
310
309
312
311
314
313
316
315
318
317
Reactor Building
Product Silos
Dryer Bldg
PVC Warehouse
Supervisor's Office and Gas Monitoring Trailer
Boiler House
Paste Warehouse
Roadway
Loading Dock
Paste Control Room
Pump House
Lunch Room
Mask Room
Maintenance
Key
= Reactors
= Paste Reactors
= Tanks

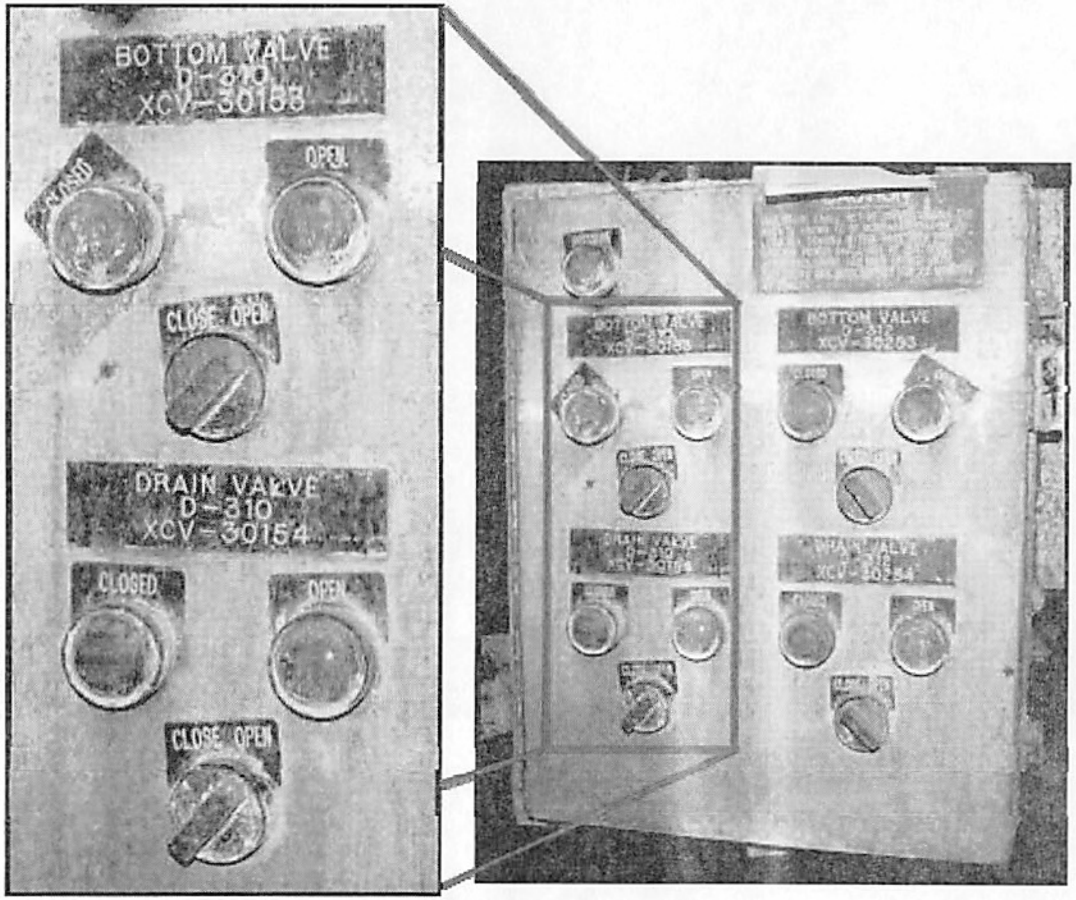
PVC Manufacturing Process


Gas holder
Compressor
Condenser
Incinerator
Recovered VCM hold tank
Water
Emulsifier
Initiator
VCM storage
Reactor
Stripper hold tank
Stripper
Product drying system

Reactor Elevation View

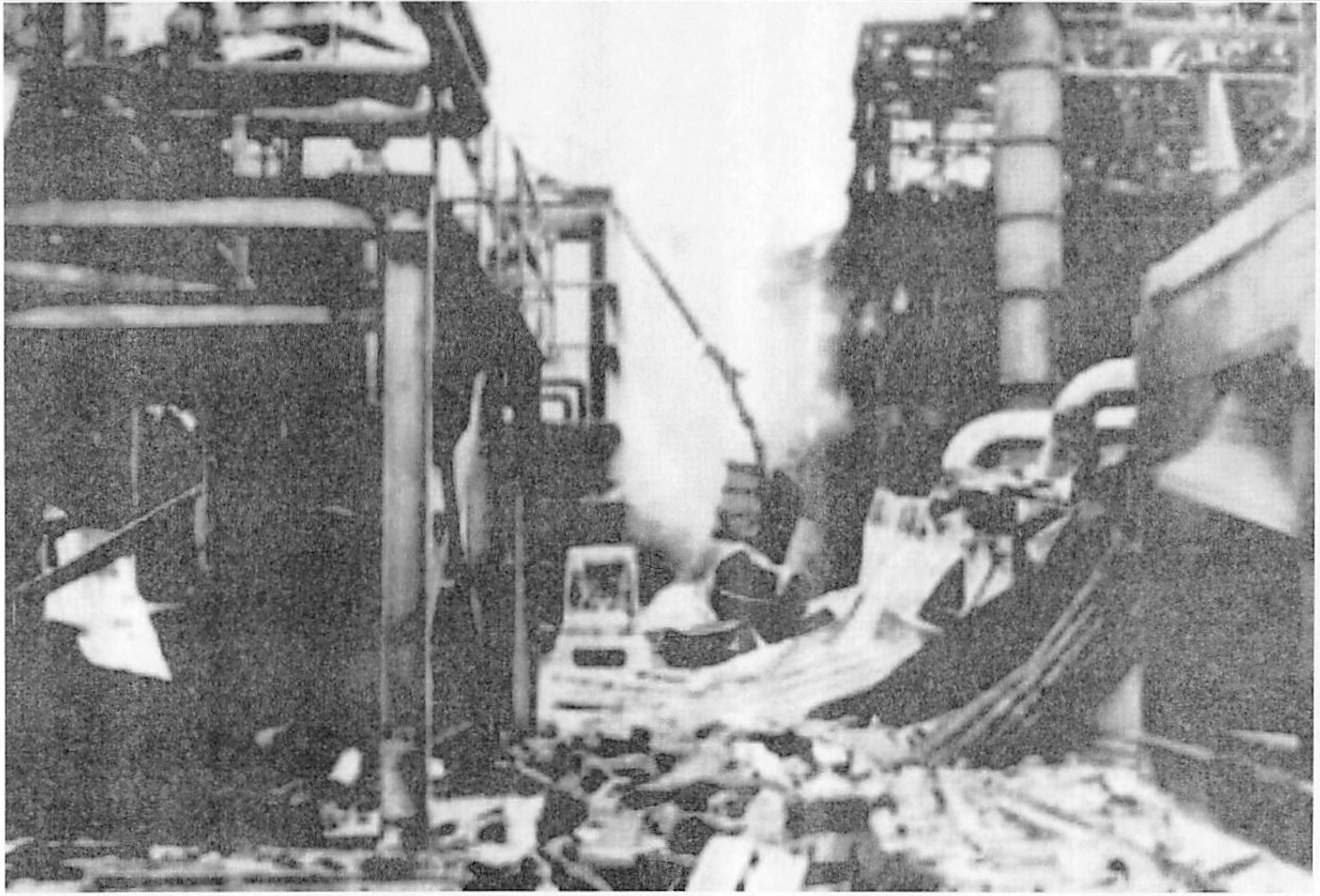

FIREWALL
Stairwell
Poly Operator on top level
Blaster Operator on bottom level

Bottom Valve Control Station


BOTTOM VALVE
D-310
XCV-30158
CLOSED
OPEN
CLOSE OPEN
DRAIN VALVE
D-310
XCV-30154
CLOSED
OPEN
CLOSE OPEN
BOTTOM VALVE
D-312
XCV-30253
DRAIN VALVE
D-312
XCV-30254

Process

Recommendations



NOTES

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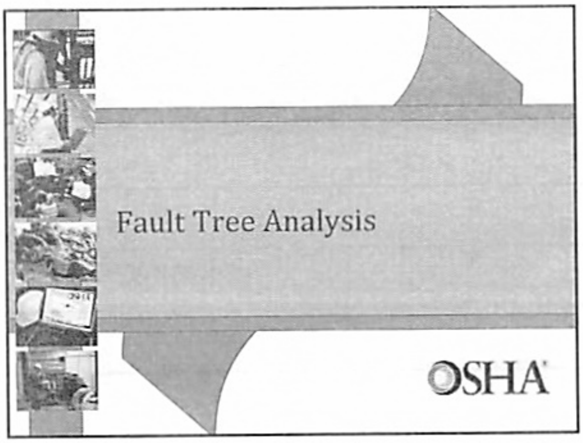
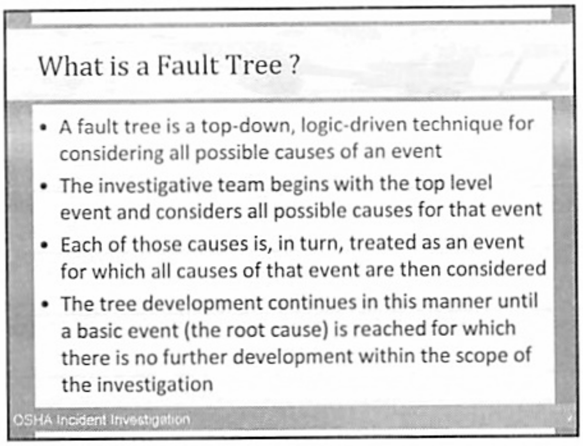


Fault Tree Analysis

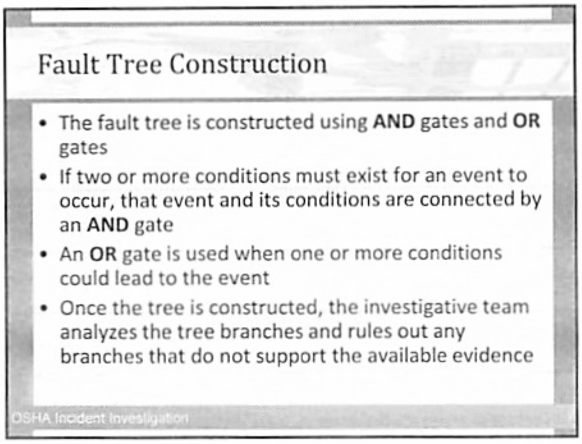
OSHA



What is a Fault Tree ?

- A fault tree is a top-down, logic-driven technique for considering all possible causes of an event
- The investigative team begins with the top level event and considers all possible causes for that event
- Each of those causes is, in turn, treated as an event for which all causes of that event are then considered
- The tree development continues in this manner until a basic event (the root cause) is reached for which there is no further development within the scope of the investigation

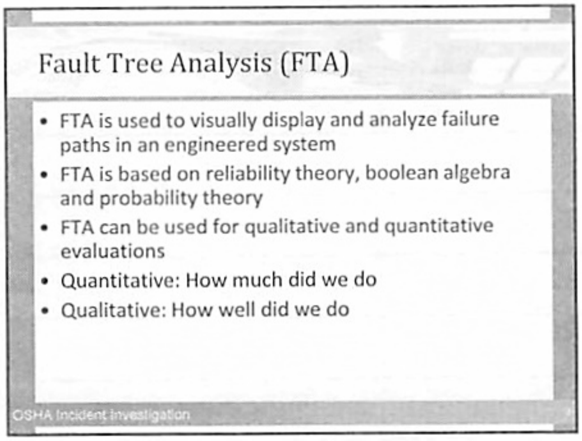
OSHA Incident Investigation



Fault Tree Construction

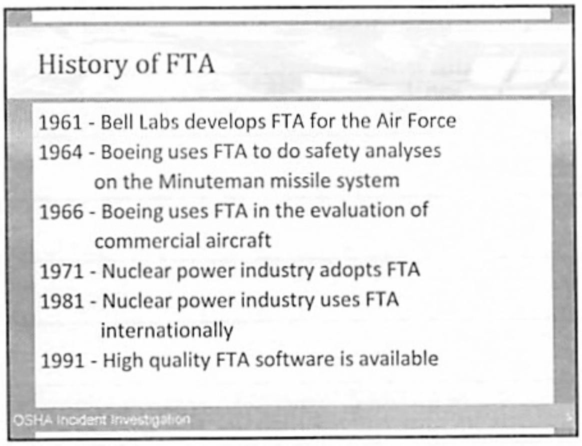
- The fault tree is constructed using **AND** gates and **OR** gates
- If two or more conditions must exist for an event to occur, that event and its conditions are connected by an **AND** gate
- An **OR** gate is used when one or more conditions could lead to the event
- Once the tree is constructed, the investigative team analyzes the tree branches and rules out any branches that do not support the available evidence

OSHA Incident Investigation



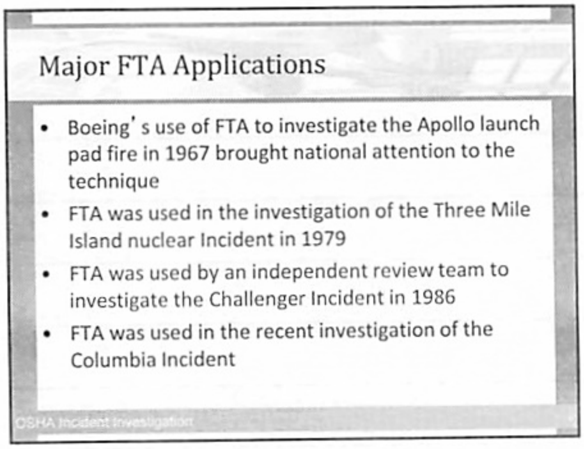
Fault Tree Analysis (FTA)

- FTA is used to visually display and analyze failure paths in an engineered system
- FTA is based on reliability theory, boolean algebra and probability theory
- FTA can be used for qualitative and quantitative evaluations
- Quantitative: How much did we do
- Qualitative: How well did we do



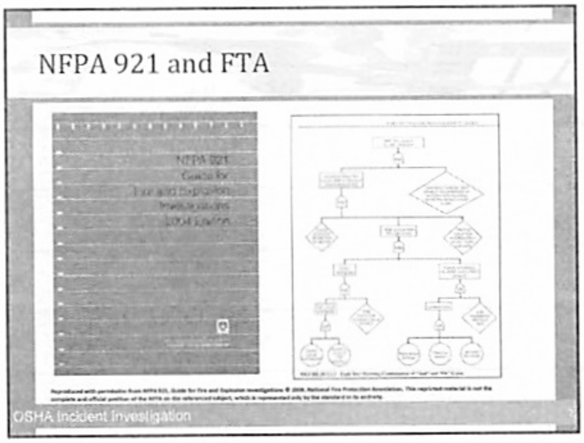
History of FTA

1961 - Bell Labs develops FTA for the Air Force
1964 - Boeing uses FTA to do safety analyses on the Minuteman missile system
1966 - Boeing uses FTA in the evaluation of commercial aircraft
1971 - Nuclear power industry adopts FTA
1981 - Nuclear power industry uses FTA internationally
1991 - High quality FTA software is available



Major FTA Applications

- Boeing's use of FTA to investigate the Apollo launch pad fire in 1967 brought national attention to the technique
- FTA was used in the investigation of the Three Mile Island nuclear Incident in 1979
- FTA was used by an independent review team to investigate the Challenger Incident in 1986
- FTA was used in the recent investigation of the Columbia Incident



NFPA 921 and FTA

NFPA 921
Guide for
Fire and Explosion
Investigations
2004 Edition

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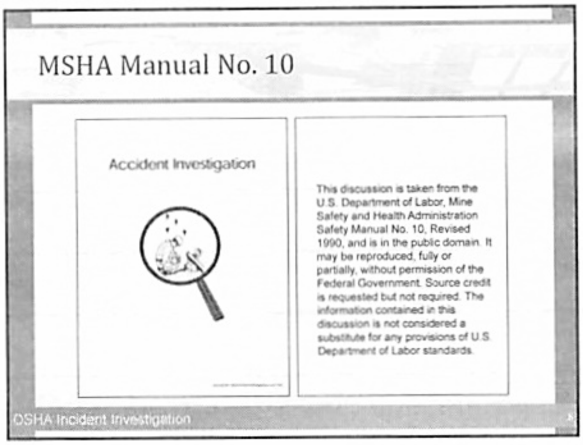
OSHA Incident Investigation

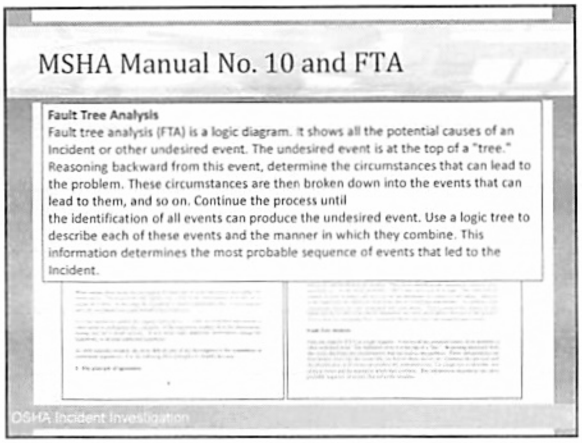


MSHA Manual No. 10

Accident Investigation

This discussion is taken from the U.S. Department of Labor, Mine Safety and Health Administration Safety Manual No. 10, Revised 1990, and is in the public domain. It may be reproduced, fully or partially, without permission of the Federal Government. Source credit is requested but not required. The information contained in this discussion is not considered a substitute for any provisions of U.S. Department of Labor standards.

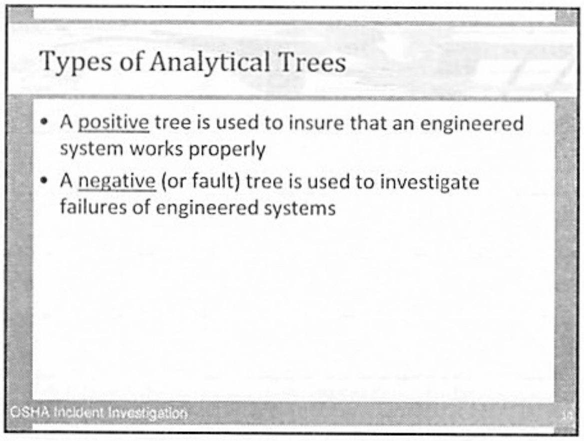
OSHA Incident Investigation



MSHA Manual No. 10 and FTA

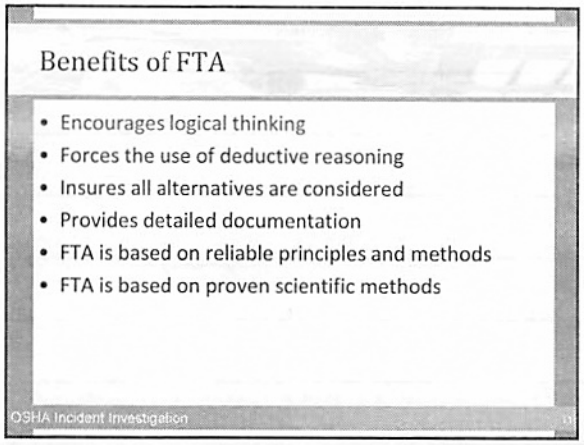
Fault Tree Analysis
Fault tree analysis (FTA) is a logic diagram. It shows all the potential causes of an Incident or other undesired event. The undesired event is at the top of a "tree." Reasoning backward from this event, determine the circumstances that can lead to the problem. These circumstances are then broken down into the events that can lead to them, and so on. Continue the process until
the identification of all events can produce the undesired event. Use a logic tree to describe each of these events and the manner in which they combine. This information determines the most probable sequence of events that led to the Incident.

OSHA Incident Investigation



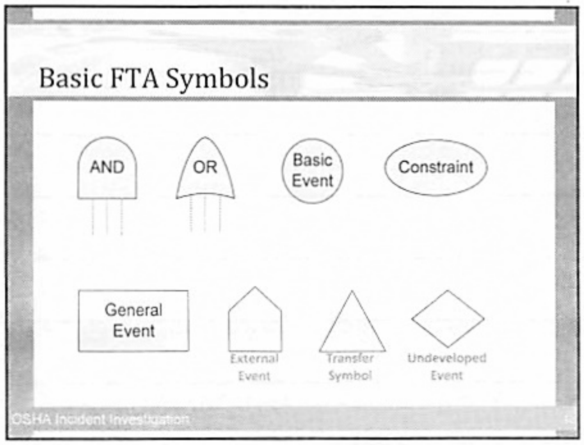
Types of Analytical Trees

- A positive tree is used to insure that an engineered system works properly
- A negative (or fault) tree is used to investigate failures of engineered systems



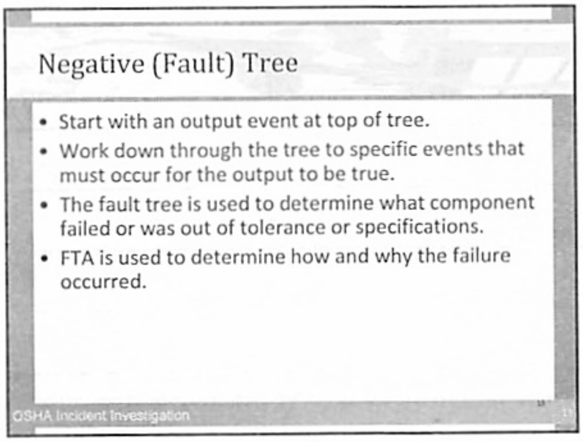
Benefits of FTA

- Encourages logical thinking
- Forces the use of deductive reasoning
- Insures all alternatives are considered
- Provides detailed documentation
- FTA is based on reliable principles and methods
- FTA is based on proven scientific methods



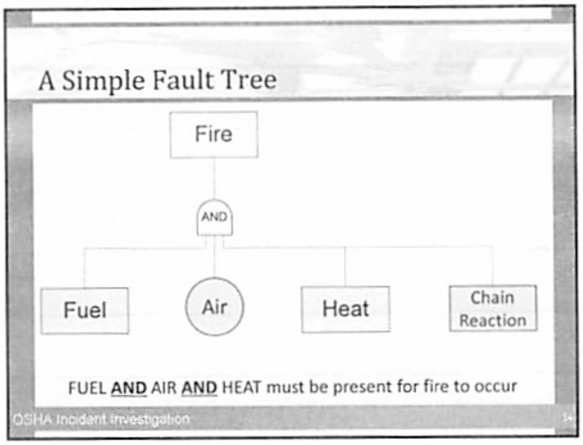
Basic FTA Symbols

AND
OR
Basic Event
Constraint
General Event
External Event
Transfer Symbol
Undeveloped Event



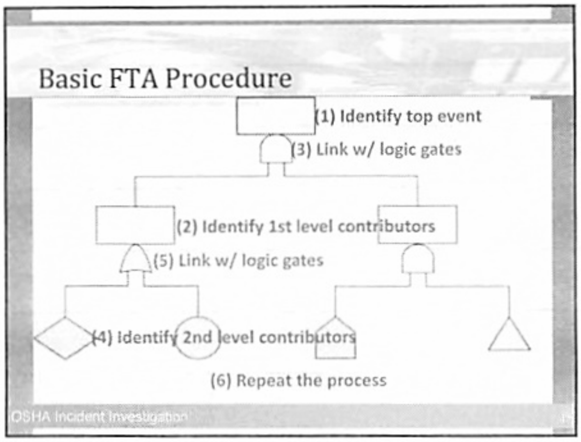
Negative (Fault) Tree

- Start with an output event at top of tree.
- Work down through the tree to specific events that must occur for the output to be true.
- The fault tree is used to determine what component failed or was out of tolerance or specifications.
- FTA is used to determine how and why the failure occurred.



A Simple Fault Tree

FUEL **AND** AIR **AND** HEAT must be present for fire to occur



Basic FTA Procedure

(1) Identify top event

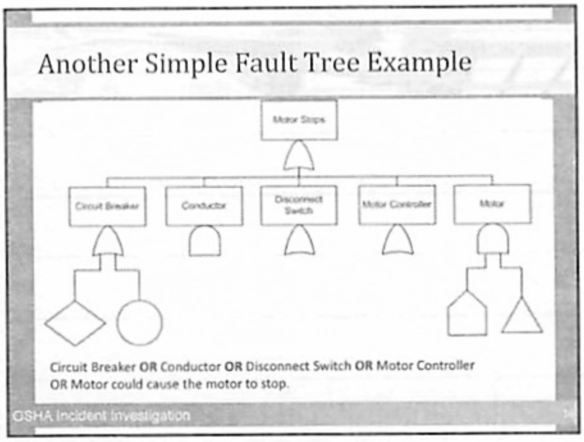
(3) Link w/ logic gates

(2) Identify 1st level contributors

(5) Link w/ logic gates

(4) Identify 2nd level contributors

(6) Repeat the process



Another Simple Fault Tree Example

Motor Stops

Circuit Breaker

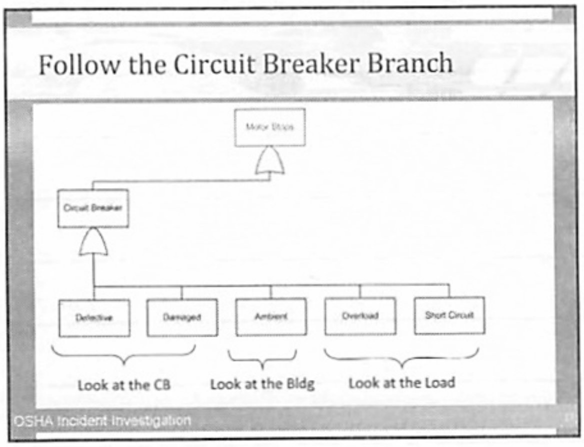
Conductor

Disconnect Switch

Motor Controller

Motor

Circuit Breaker **OR** Conductor **OR** Disconnect Switch **OR** Motor Controller **OR** Motor could cause the motor to stop.



Follow the Circuit Breaker Branch

Motor Stops

Circuit Breaker

Defective

Damaged

Ambient

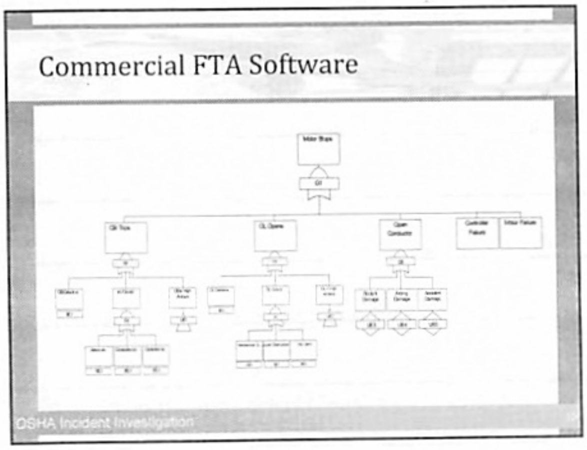
Overload

Short Circuit

Look at the CB

Look at the Bldg

Look at the Load



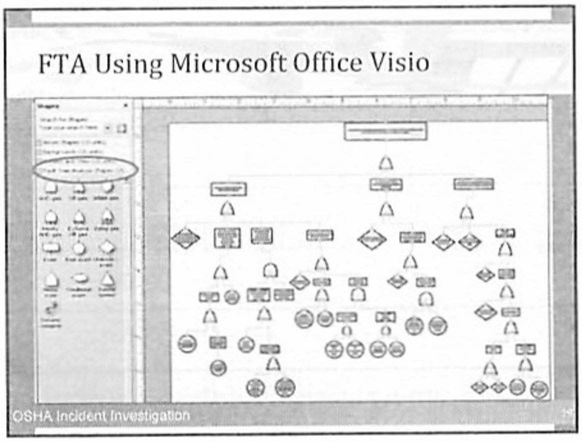
Commercial FTA Software

Motor Stops

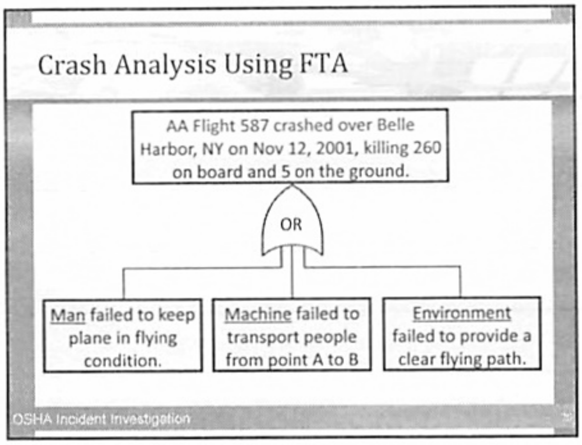
Open Conductor

Controller Failure

Motor Failure



FTA Using Microsoft Office Visio



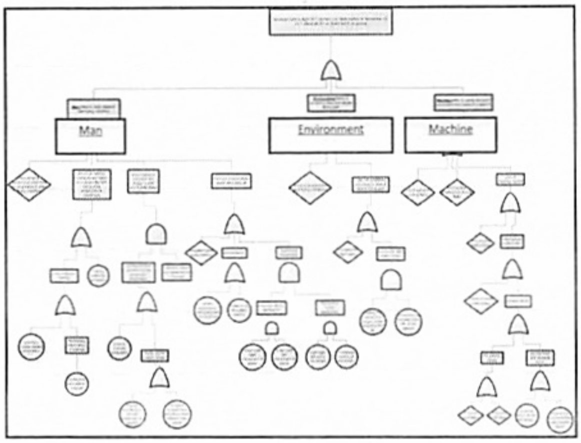
Crash Analysis Using FTA

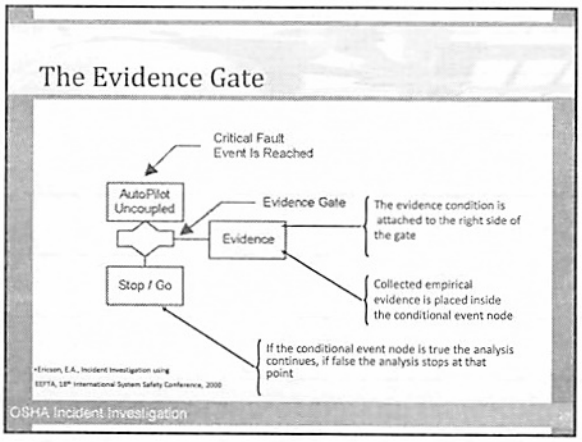
AA Flight 587 crashed over Belle Harbor, NY on Nov 12, 2001, killing 260 on board and 5 on the ground.

Man failed to keep plane in flying condition.

Machine failed to transport people from point A to B

Environment failed to provide a clear flying path.





The Evidence Gate

Critical Fault Event Is Reached

AutoPilot Uncoupled

Evidence Gate

Evidence

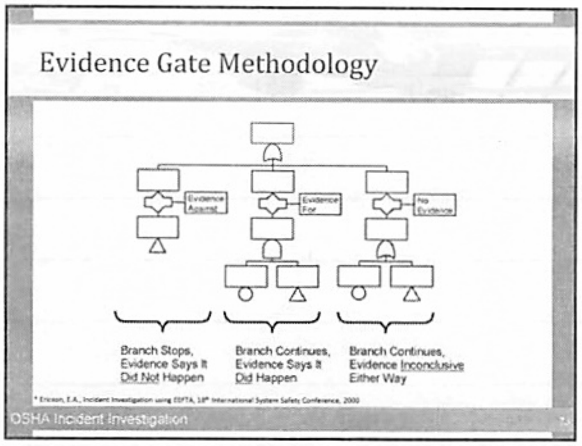
Stop / Go

The evidence condition is attached to the right side of the gate

Collected empirical evidence is placed inside the conditional event node

If the conditional event node is true the analysis continues, if false the analysis stops at that point

•Ericson, E.A., Incident Investigation using EEFTA, 18th International System Safety Conference, 2000



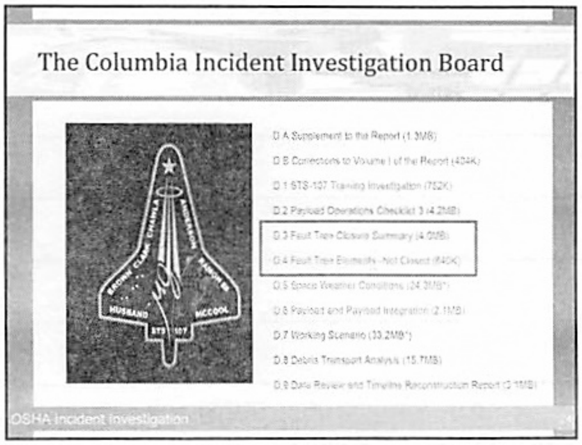
Evidence Gate Methodology

Branch Stops, Evidence Says It Did Not Happen

Branch Continues, Evidence Says It Did Happen

Branch Continues, Evidence Inconclusive Either Way

* Ericson, E.A., Incident Investigation using EEFTA, 18th International System Safety Conference, 2000



The Columbia Incident Investigation Board

HUSBAND
MCCOOL
STS 107

D.A Supplement to the Report (1.3MB)

D.B Corrections to Volume I of the Report (404K)

D.1 STS-107 Training Investigation (752K)

D.2 Payload Operations Checklist 3 (4.2MB)

D.3 Fault Tree Closure Summary (4.0MB)

D.4 Fault Tree Elements - Not Closed (840K)

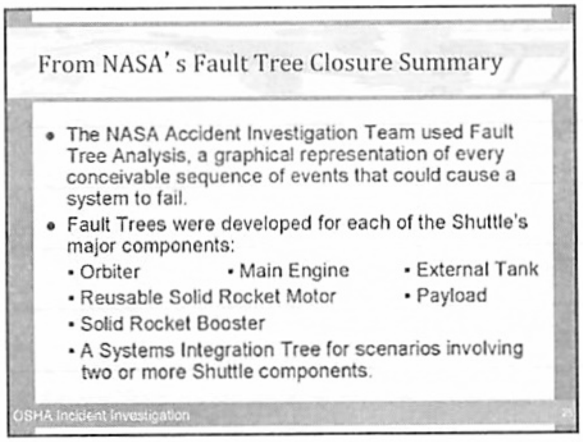
D.5 Space Weather Conditions (24.3MB*)

D.6 Payload and Payload Integration (2.1MB)

D.7 Working Scenario (33.2MB*)

D.8 Debris Transport Analysis (15.7MB)

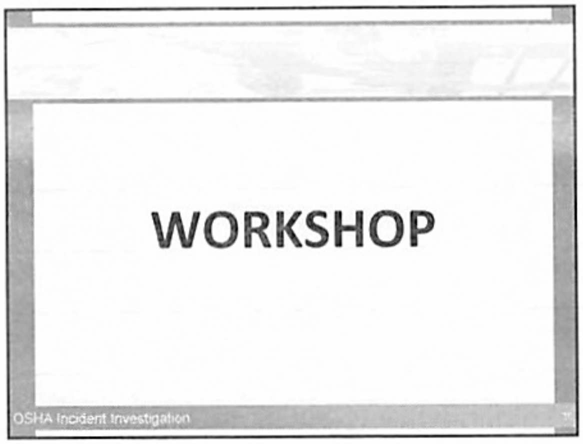
D.9 Data Review and Timeline Reconstruction Report (3.1MB)



From NASA’s Fault Tree Closure Summary

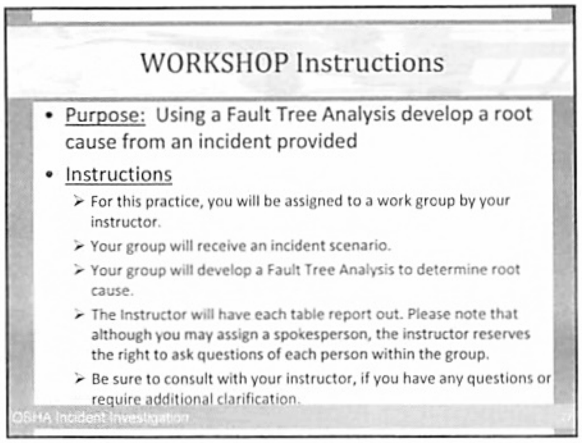
- The NASA Accident Investigation Team used Fault Tree Analysis, a graphical representation of every conceivable sequence of events that could cause a system to fail.
- Fault Trees were developed for each of the Shuttle's major components:
  - Orbiter
  - Main Engine
  - External Tank
  - Reusable Solid Rocket Motor
  - Payload
  - Solid Rocket Booster
  - A Systems Integration Tree for scenarios involving two or more Shuttle components.

OSHA Incident Investigation



WORKSHOP

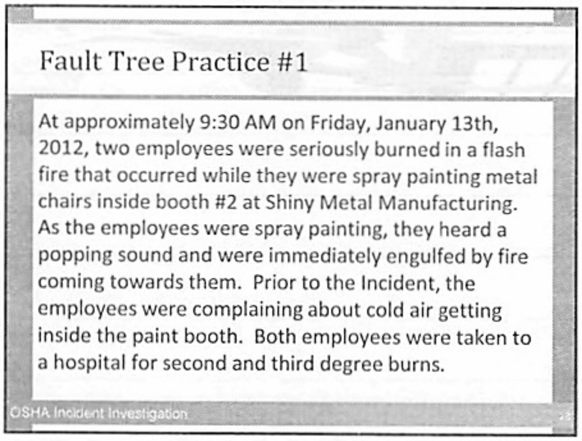
OSHA Incident Investigation



WORKSHOP Instructions

- Purpose: Using a Fault Tree Analysis develop a root cause from an incident provided
- Instructions
  - ➢ For this practice, you will be assigned to a work group by your instructor.
  - ➢ Your group will receive an incident scenario.
  - ➢ Your group will develop a Fault Tree Analysis to determine root cause.
  - ➢ The Instructor will have each table report out. Please note that although you may assign a spokesperson, the instructor reserves the right to ask questions of each person within the group.
  - ➢ Be sure to consult with your instructor, if you have any questions or require additional clarification.

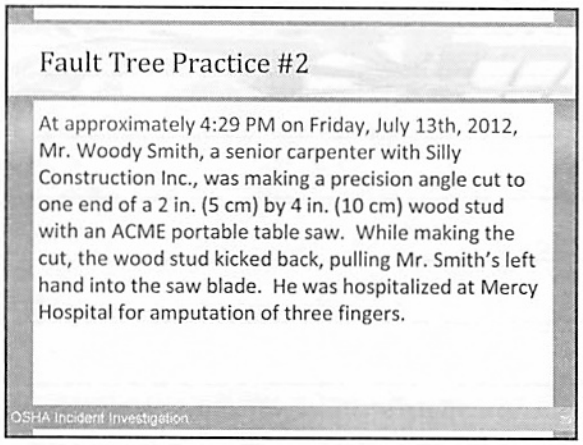
OSHA Incident Investigation



Fault Tree Practice #1

At approximately 9:30 AM on Friday, January 13th, 2012, two employees were seriously burned in a flash fire that occurred while they were spray painting metal chairs inside booth #2 at Shiny Metal Manufacturing. As the employees were spray painting, they heard a popping sound and were immediately engulfed by fire coming towards them. Prior to the Incident, the employees were complaining about cold air getting inside the paint booth. Both employees were taken to a hospital for second and third degree burns.

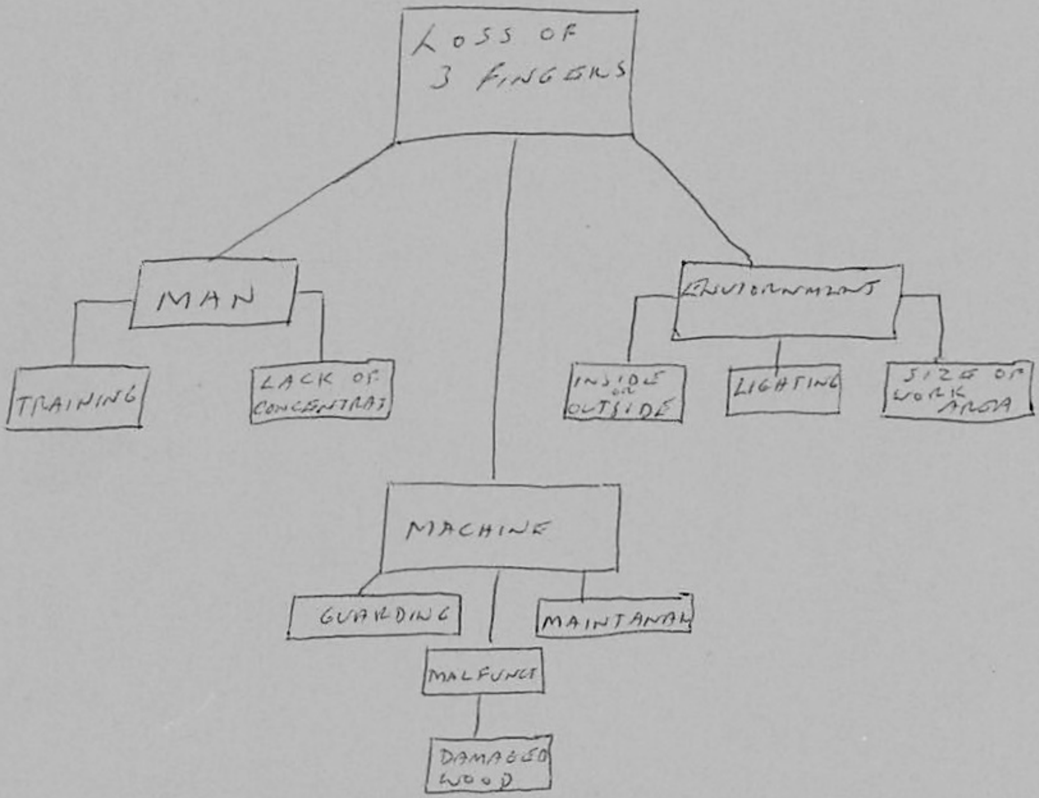
OSHA Incident Investigation



Fault Tree Practice #2

At approximately 4:29 PM on Friday, July 13th, 2012, Mr. Woody Smith, a senior carpenter with Silly Construction Inc., was making a precision angle cut to one end of a 2 in. (5 cm) by 4 in. (10 cm) wood stud with an ACME portable table saw. While making the cut, the wood stud kicked back, pulling Mr. Smith's left hand into the saw blade. He was hospitalized at Mercy Hospital for amputation of three fingers.

OSHA Incident Investigation


LOSS OF
3 FINGERS
MAN
TRAINING
LACK OF
CONCENTRAT
MACHINE
GUARDING
MALFUNCT
DAMAGED
WOOD
MAINTANAN
ENVIRONMENT
INSIDE
OR
OUTSIDE
LIGHTING
SIZE OF
WORK
AREA

Workshop Practice: Fault Tree Analysis

Student Instructions

Purpose: Using a Fault Tree Analysis develop a root cause from an incident provided

Instructions

1. For this practice, you will be assigned to a work group by your instructor.
2. Your group will receive an incident scenario.
3. Your group will develop a Fault Tree Analysis to determine root cause.
4. The Instructor will have each table report out. Please note that although you may assign a spokesperson, the instructor reserves the right to ask questions of each person within the group.
5. Be sure to consult with your instructor, if you have any questions or require additional clarification.

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Scenario #2

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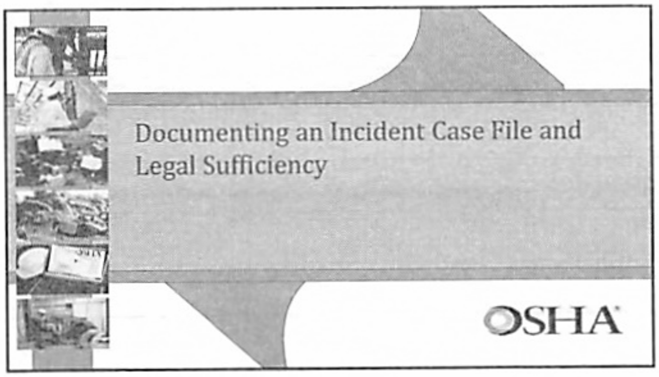
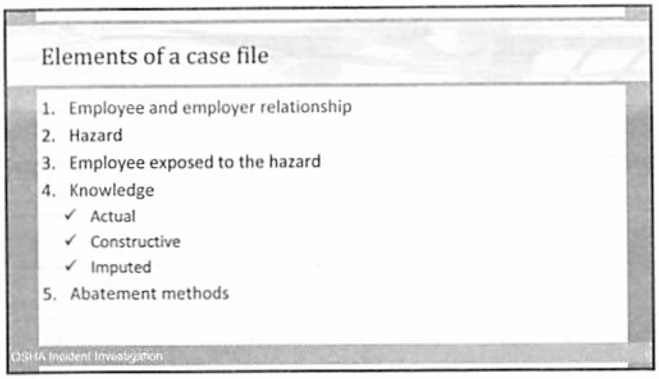
Workshop Practice: Fault Tree Analysis
Scenario #1

Workshop Practice: Fault Tree Analysis
Scenario #2



Documenting an Incident Case File and Legal Sufficiency

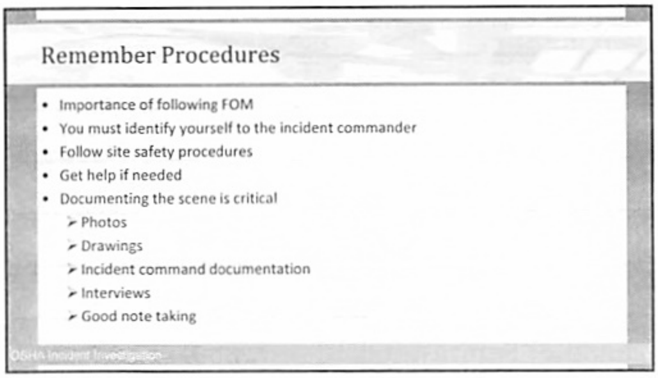
OSHA



Elements of a case file

1. Employee and employer relationship
2. Hazard
3. Employee exposed to the hazard
4. Knowledge
   - ✓ Actual
   - ✓ Constructive
   - ✓ Imputed
5. Abatement methods

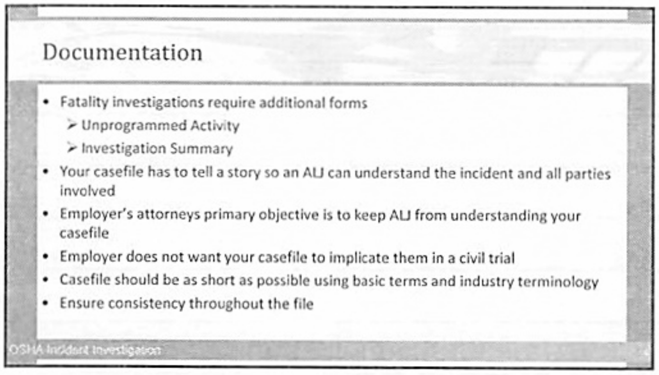
OSHA Incident Investigation



Remember Procedures

- Importance of following FOM
- You must identify yourself to the incident commander
- Follow site safety procedures
- Get help if needed
- Documenting the scene is critical
  - ➢ Photos
  - ➢ Drawings
  - ➢ Incident command documentation
  - ➢ Interviews
  - ➢ Good note taking

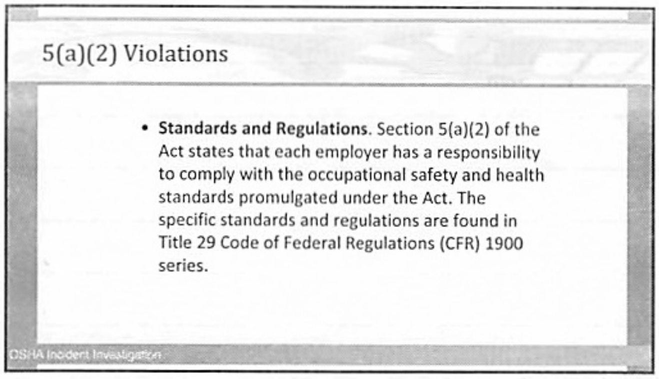
OSHA Incident Investigation



Documentation

- Fatality investigations require additional forms
  - ➢ Unprogrammed Activity
  - ➢ Investigation Summary
- Your casefile has to tell a story so an ALJ can understand the incident and all parties involved
- Employer's attorneys primary objective is to keep ALJ from understanding your casefile
- Employer does not want your casefile to implicate them in a civil trial
- Casefile should be as short as possible using basic terms and industry terminology
- Ensure consistency throughout the file

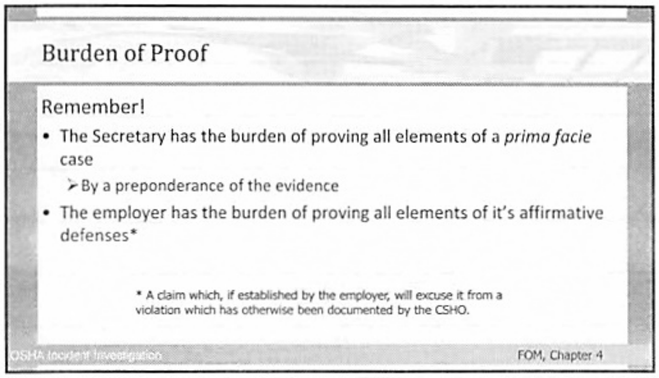
OSHA Incident Investigation



5(a)(2) Violations

- **Standards and Regulations**. Section 5(a)(2) of the Act states that each employer has a responsibility to comply with the occupational safety and health standards promulgated under the Act. The specific standards and regulations are found in Title 29 Code of Federal Regulations (CFR) 1900 series.

OSHA Incident Investigation



Burden of Proof

Remember!

- The Secretary has the burden of proving all elements of a *prima facie* case
  - ➢ By a preponderance of the evidence
- The employer has the burden of proving all elements of it's affirmative defenses*

* A claim which, if established by the employer, will excuse it from a violation which has otherwise been documented by the CSHO.

OSHA Incident Investigation

FOM, Chapter 4

Practice: Final Workshop

Student Instructions

Purpose: Utilize incident investigative techniques from the course to determine root cause for the incident.

Instructions

1. For this practice, you will be assigned to a work group by your instructor.
2. Your group will develop the following items based on the preceding videos
    a. Employer(s), Multi-Employer
    b. Un-programmed Activity
    c. Investigative Activity
    d. Employee Exposure, Employer Knowledge
    e. Causal Factor and Fault Tree Analysis
    f. Hazards based on analysis
    g. Two Applicable standards
3. The Instructor will have each table report out. Please note that although you may assign a spokesperson, the instructor reserves the right to ask questions of each person within the group.
4. Be sure to consult with your instructor, if you have any questions or require additional clarification.

Incident [Accident] Investigation

Final Work Shop

OSHA®

Final Workshop Case Study

On Nov 28, 1989, a construction crane fell more than 16 stories into the heart of San Francisco's financial district, killing five people.

1 Month after 7.5 mag earthquake
20 Story Bld.
8:10am - crane collapse
✓ 16 story crane (Tower crane) 120 Tons
Struck Highrise Blds
Emergency personnell arr
3 Iron workers, 1 Bus driver, 1 Crane opr. (DEAD)
150 Busin closed (Financial distr closed)

Final Workshop Case Study

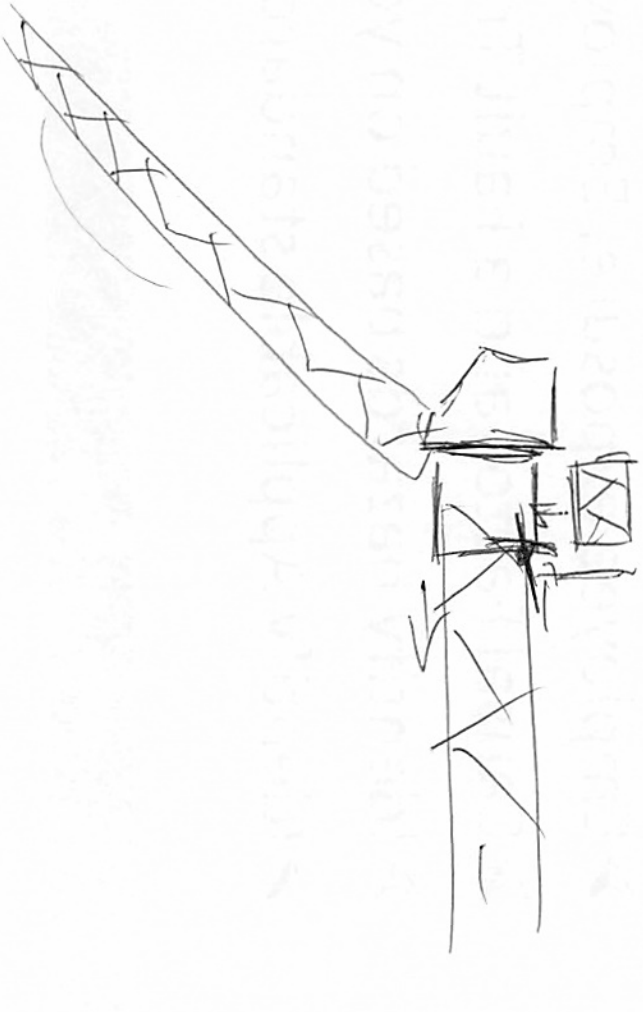
- Within your groups you will develop the following based on the preceding videos ;
  - ➢Employer(s), Multi-Employer
  - ➢Unprogrammed Activity
  - ➢Investigation Activity
  - ➢Employee exposure, Employer Knowledge
  - ➢Causal Factor and a Fault Tree Analysis
  - ➢Identify hazards based on your Analysis
  - ➢Identify Applicable standards (no more than two)

- Hook - EMPTY (in Blds across street (Kearny St)
- CRANE - FELL BACKWARDS
- poss. structural damage to crane from earthquake
- poss. crane operator error or suicide

* - ME - Rpt - no sub. impairment

- SECTIONS were add to Tower crane

* - crane poss. out of balance



U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

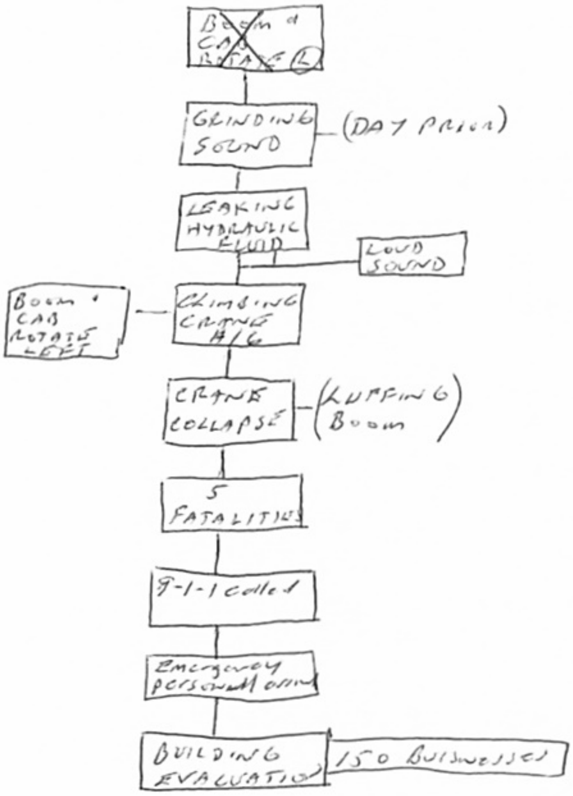
Reporting ID		Previous Activity(Type & Number)		Referral Number		
Establishment Information	Establishment Name	THE ERECTION COMPANY		Employer ID		
	Site Address	600 California ST.		City Code		County Code
		Site Phone		Site Fax		
	Mailing Address					
	Event Address	SAME				
Industry & Ownership	Type of Business		Primary SIC		No. of Employees	
	Ownership					
Receipt Information	Reported By		Date	11-28-89	Time	8:
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	11-28-89	8:10 am	5			
	Type of Event	CRANE COLLAPSE				
Preliminary Description	TOWER CRANE COLLAPSED DURING CONSTRUCTION OF 20 STORY BLDG.					
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
		K7447	Q4692	N6745	A7469	
Strategic Initiatives						
National Emphasis						
Local Emphasis	CRUSHED BY / STRUCK BY					
Optional Information	Type	ID	Optional Information Value			
Comments						

Crane Collapse – Final Workshop

Fault Tree Analysis

Crane Collapse – Final Workshop

Root Cause Analysis


~~Boom & CAB ROTATE~~ (L)
GRINDING SOUND
(DAY PRIOR)
LEAKING HYDRAULIC FLUID
LOUD SOUND
Boom + CAB ROTATE LEFT
CLIMBING CRANE A/G
CRANE COLLAPSE
(LUFFING Boom)
5 FATALITIES
9-1-1 called
Emergency personnel arrive
BUILDING EVACUATION
150 Buisnesses

NOTES

NOTES

NOTES

NOTES

NOTES

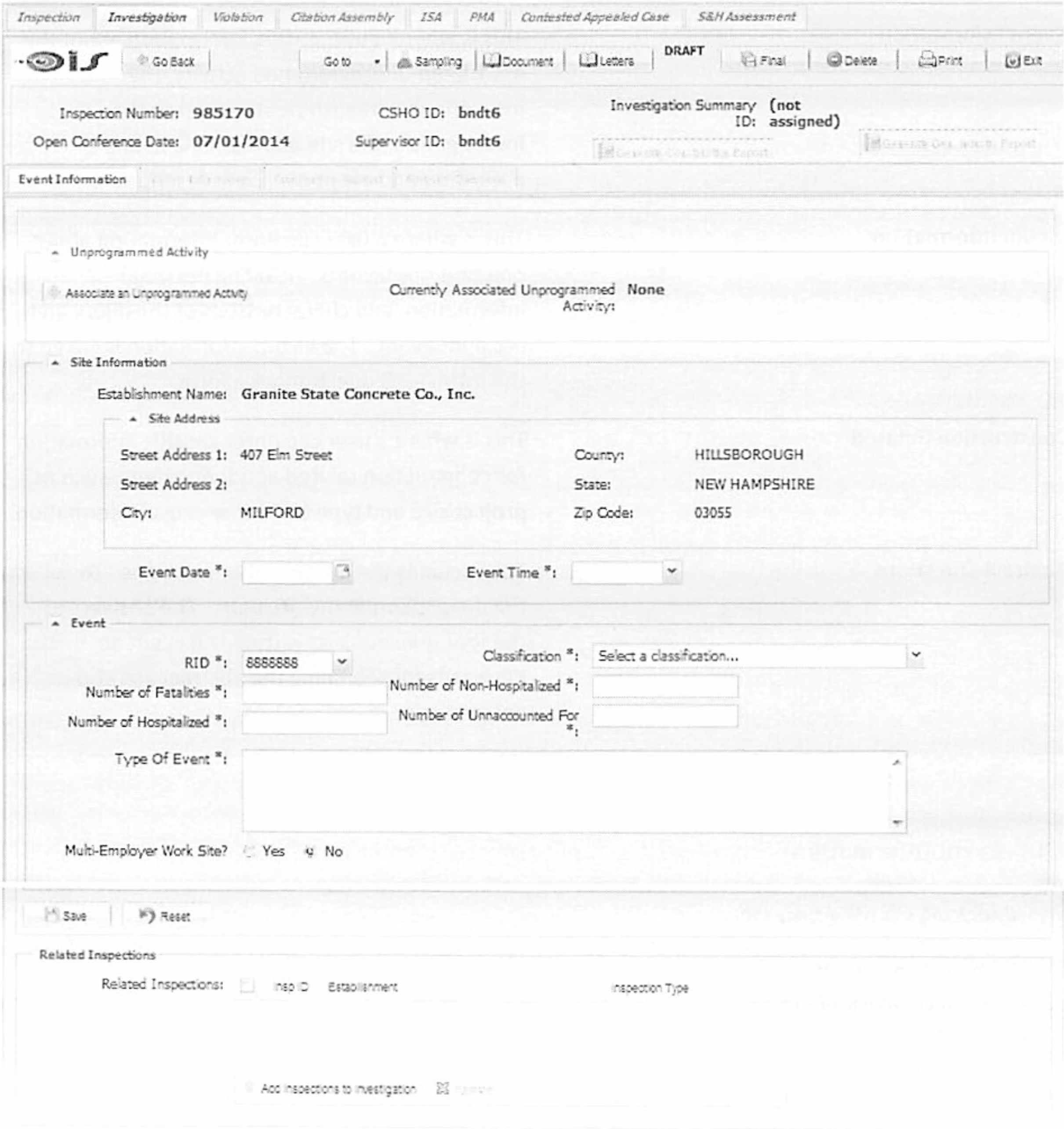
NOTES

1.2: Investigation

Note: *Only one (1) investigation is necessary for all related inspections. By default, OIS will display the...*

- *Inspection Number*
- *Open Conference Date*
- *CSHO ID*
- *Supervisor ID*

Step 1: After clicking on the **Investigation** tab the following screen will be displayed.


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
OIS
Go Back
Go to
Sampling
Document
Letters
DRAFT
Final
Delete
Print
Exit
Event Information
Unprogrammed Activity
Associate an Unprogrammed Activity
Site Information
Site Address
Event
Save
Reset
Related Inspections
Add Inspections to Investigation

Inspection Number: 985170
CSHO ID: bndt6
Investigation Summary ID: (not assigned)
Open Conference Date: 07/01/2014
Supervisor ID: bndt6

Currently Associated Unprogrammed Activity: None

Establishment Name: Granite State Concrete Co., Inc.

Street Address 1: 407 Elm Street
Street Address 2:
City: MILFORD
County: HILLSBOROUGH
State: NEW HAMPSHIRE
Zip Code: 03055

Event Date *:
Event Time *:

RID *: 8888888
Classification *: Select a classification...
Number of Fatalities *:
Number of Non-Hospitalized *:
Number of Hospitalized *:
Number of Unaccounted For *:
Type Of Event *:
Multi-Employer Work Site? ○ Yes ● No

Related Inspections: ☐ Insp ID Establishment Inspection Type

General Description
The Investigation module contains the following tabs: Event Information, Victim Information, Construction Related, and Abstract Questions.

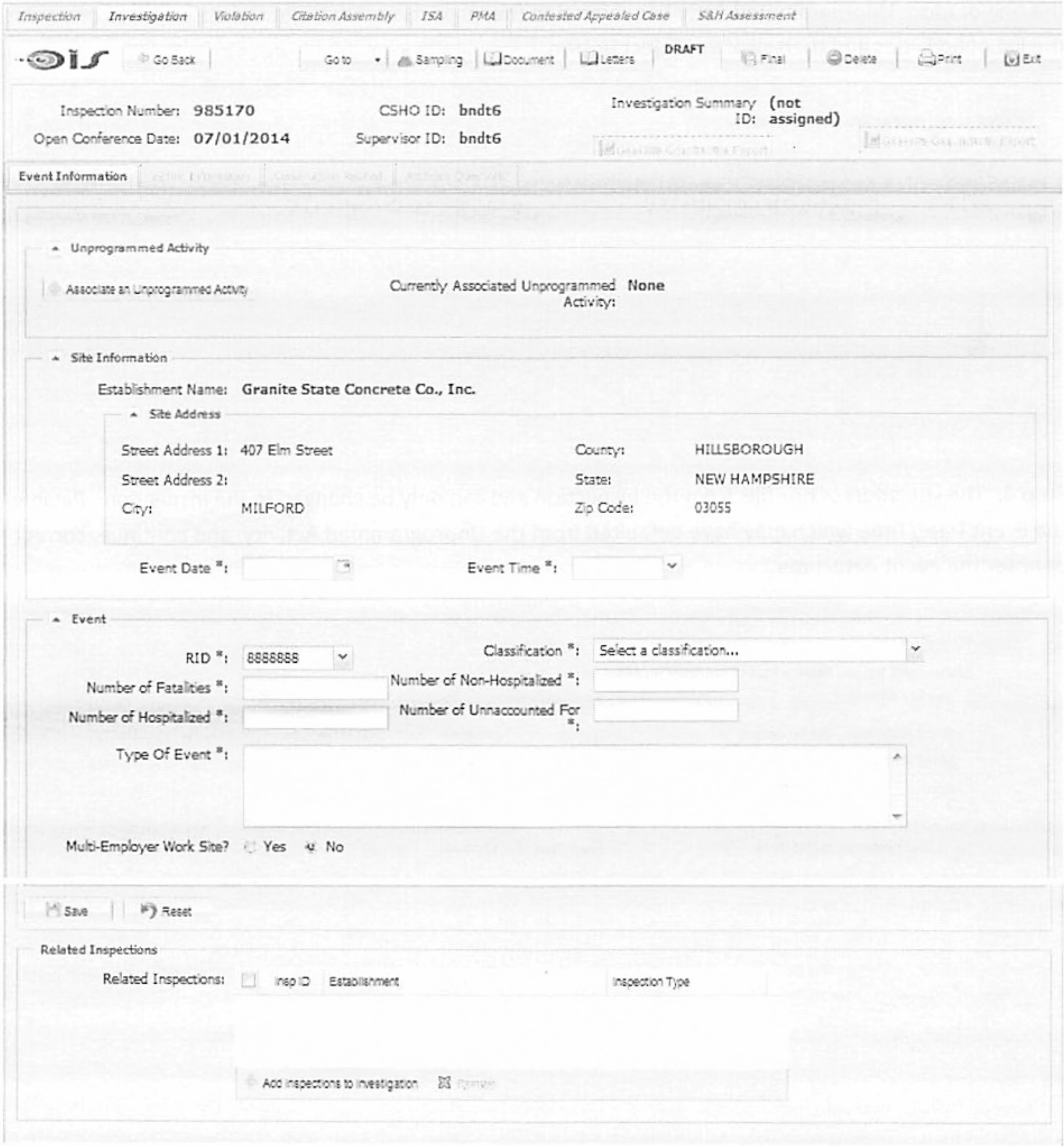
Screen Specifics	
Field or Screen Element	**Comment**
Event Information	This is where a user enters information about the associated unprogrammed activity, the inspections/establishments linked to the investigation, the site address, and event date/time and event overview description.
Victim Information	This is where a user can enter information about one or more Victims, including personal information, and characteristics of the injury and accident event. The victim information is linked to the IMMLANG questionnaire form.
Construction Related	This is where a user can enter specific information for construction related accident events, such as project size and type and some causal information.
Abstract Questions	This includes the four questions designed to collect the description of the accident. The answers to the four questions constitute the event abstract. Keywords for searching the abstract are also entered here.

1.2.1: Event Information

By default, OIS will display the...

- *Inspection Number*
- *Open Conference Date*
- *CSHO ID*
- *Supervisor ID*

Step 1: The Event Information sub tab is the first screen displayed by default as shown below.


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
DRAFT
Final
Delete
Print
Exit
Event Information
Unprogrammed Activity
Associate an Unprogrammed Activity
Site Information
Site Address
Event
Save
Reset
Related Inspections
Insp ID
Establishment
Inspection Type
Add inspections to investigation
Remove

Inspection Number: 985170
Open Conference Date: 07/01/2014
CSHO ID: bndt6
Supervisor ID: bndt6
Investigation Summary ID: (not assigned)

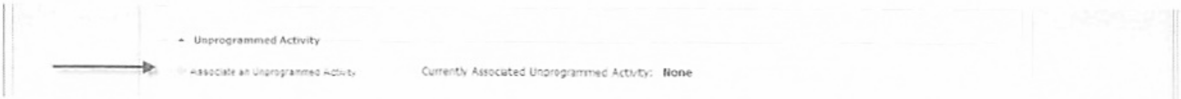
Currently Associated Unprogrammed Activity: None

Establishment Name: Granite State Concrete Co., Inc.
Street Address 1: 407 Elm Street
Street Address 2:
City: MILFORD
County: HILLSBOROUGH
State: NEW HAMPSHIRE
Zip Code: 03055
Event Date *:
Event Time *:

RID *: 8888888
Classification *: Select a classification...
Number of Fatalities *:
Number of Non-Hospitalized *:
Number of Hospitalized *:
Number of Unaccounted For *:
Type Of Event *:
Multi-Employer Work Site? ○ Yes ● No

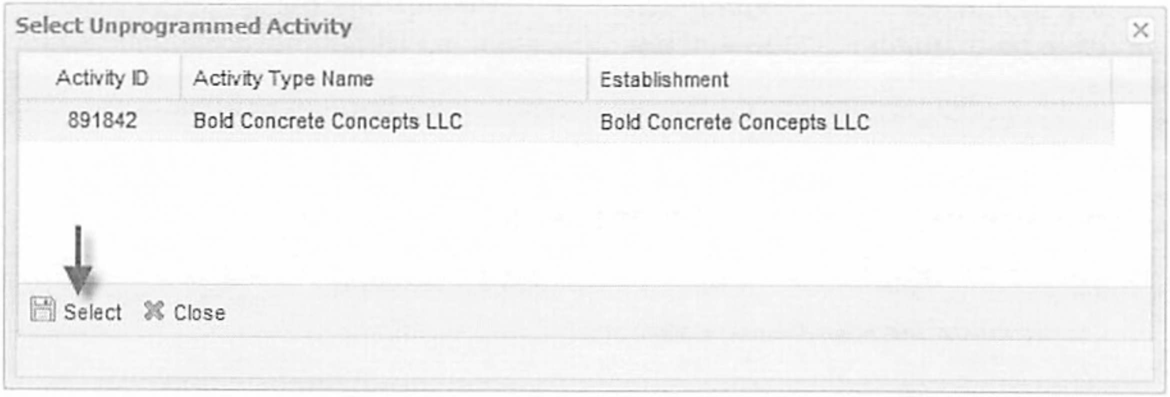
Related Inspections: ☐

Step 2: Associate the investigation with an unprogrammed activity by clicking the Associate an Unprogrammed Activity button as shown below.


Unprogrammed Activity
Associate an Unprogrammed Activity

Currently Associated Unprogrammed Activity: None

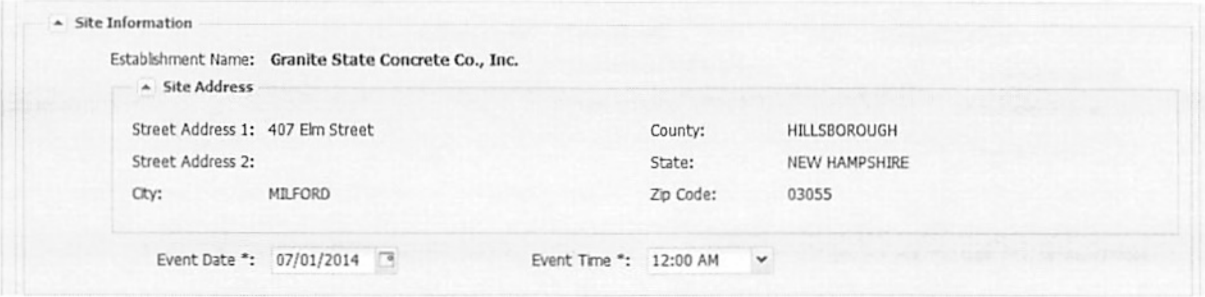
Step 3: Clicking the Associate an **Unprogrammed Activity** button will display the following screen listing the one or more Unprogrammed Activities related to the Inspection. Highlight the appropriate one from the list of activities and then click the **Select** button.



Select Unprogrammed Activity

Activity ID	Activity Type Name	Establishment
891842	Bold Concrete Concepts LLC	Bold Concrete Concepts LLC

Step 4: The site address pre-fills from the Inspection and can only be changed in the inspection. Review the Event Date/Time which may have defaulted from the Unprogrammed Activity, and continue, correct or enter the event date/time.



Site Information

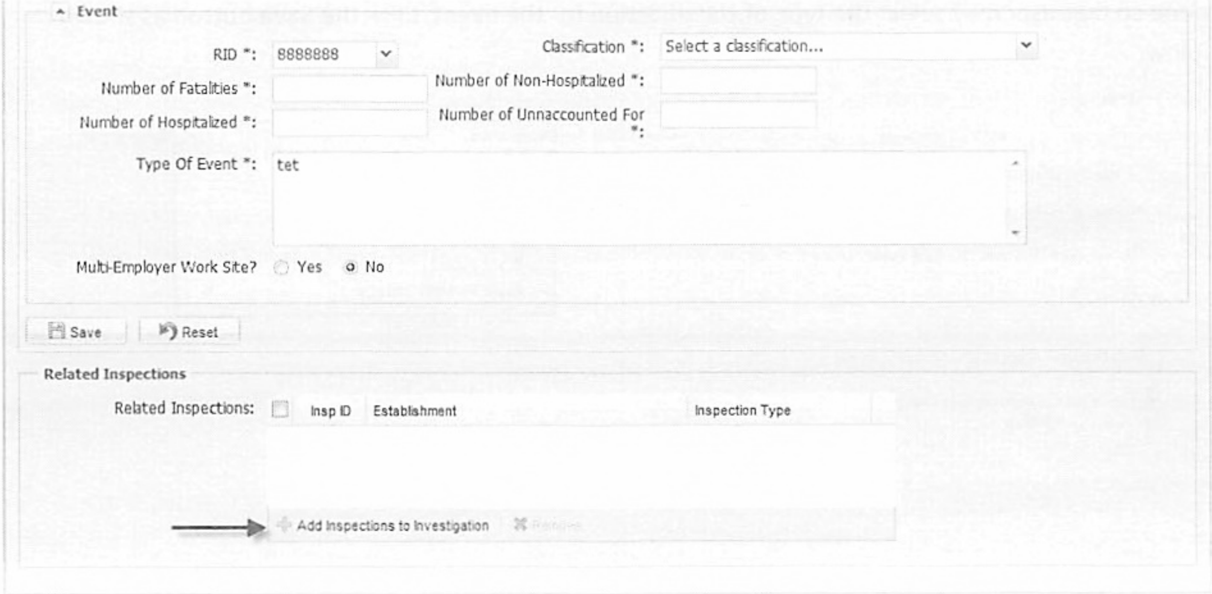
Establishment Name: **Granite State Concrete Co., Inc.**

Site Address

Street Address 1: 407 Elm Street
Street Address 2:
City: MILFORD
County: HILLSBOROUGH
State: NEW HAMPSHIRE
Zip Code: 03055

Event Date *: 07/01/2014
Event Time *: 12:00 AM

Step 5: Adding a related Inspection. Entries default from the Enforcement Activity's Inspection Number and any Inspections related to that Inspection. Click the **Add** button as show below.


Event
Save
Reset
Related Inspections
Add Inspections to Investigation
Remove

RID *: 8888888

Classification *: Select a classification...

Number of Fatalities *:

Number of Non-Hospitalized *:

Number of Hospitalized *:

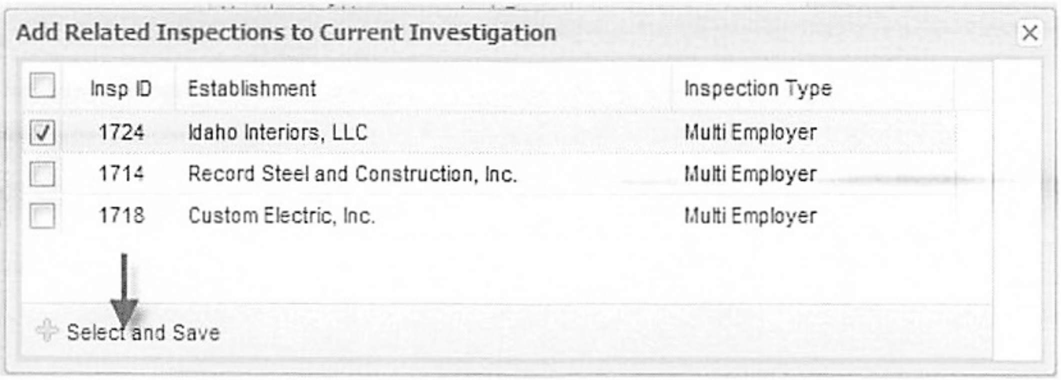
Number of Unnaccounted For *:

Type Of Event *: tet

Multi-Employer Work Site? ○ Yes ● No

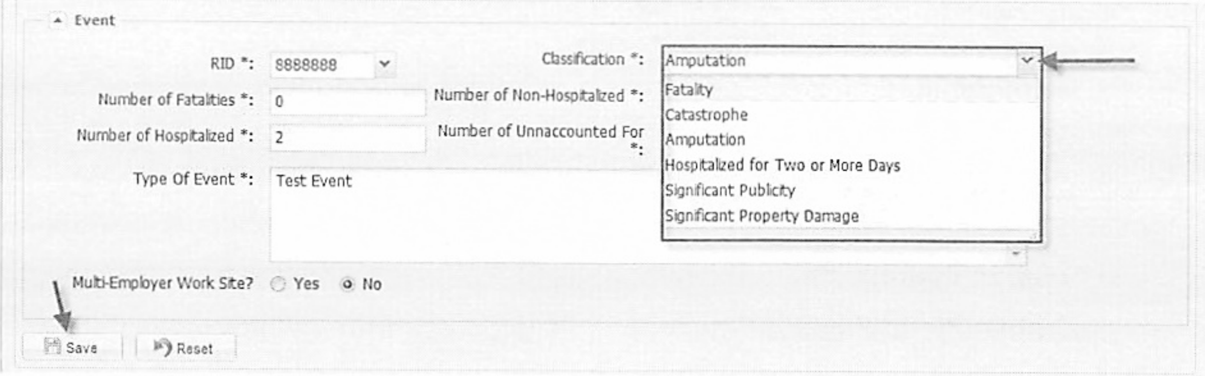
Related Inspections: ☐ Insp ID | Establishment | Inspection Type

Step 6: After clicking the **Add** button the following screen is displayed. Highlight the related Inspection ID and click the **Select and Save New Related Inspection ID** button to link a related inspection. Note that to enter victim information for the Investigation, the Inspection of the victim's establishment must be listed as a Related Inspection.


Add Related Inspections to Current Investigation
Select and Save

☐	Insp ID	Establishment	Inspection Type
☑	1724	Idaho Interiors, LLC	Multi Employer
☐	1714	Record Steel and Construction, Inc.	Multi Employer
☐	1718	Custom Electric, Inc.	Multi Employer

Step 7: Complete the rest of the items in the Event section as appropriate. Some will have defaulted from the Unprogrammed Activity and can be accepted or corrected. The classification has a dropdown menu so that user may select the type of classification for the event. Click the **Save** button as shown below.


Event
Fatality
Catastrophe
Amputation
Hospitalized for Two or More Days
Significant Publicity
Significant Property Damage
Save
Reset

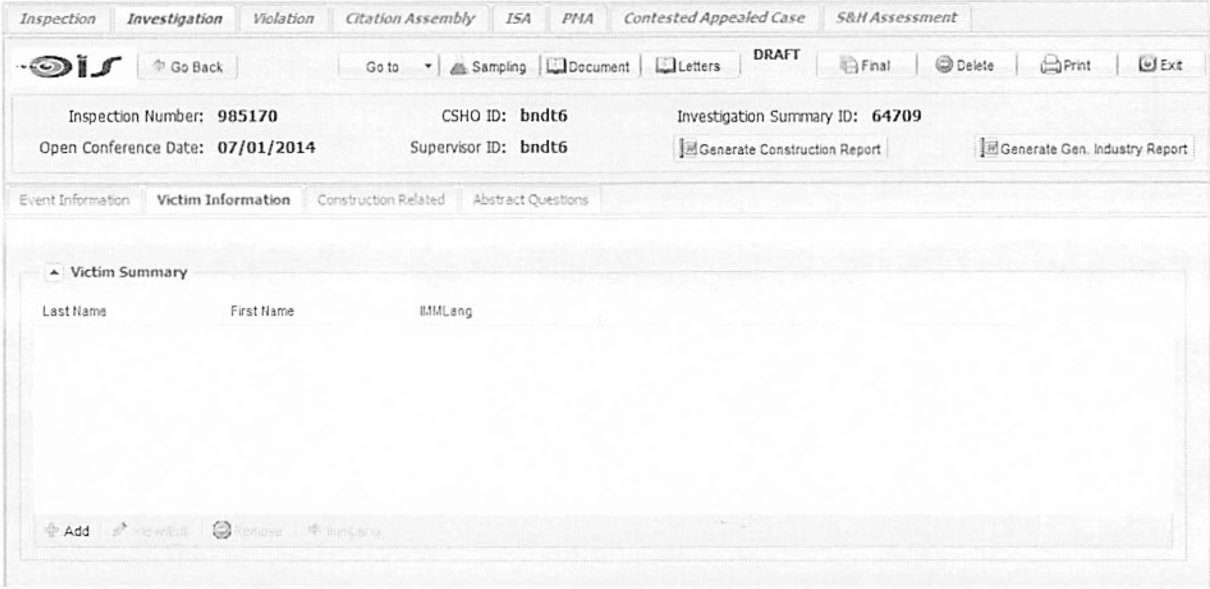
RID *: 8888888
Classification *: Amputation
Number of Fatalities *: 0
Number of Non-Hospitalized *:
Number of Hospitalized *: 2
Number of Unnaccounted For *:
Type Of Event *: Test Event
Multi-Employer Work Site? ○ Yes ● No

1.2.2: Victim Information

By default, OIS will display the...

- *Inspection Number*
- *Open Conference Date*
- *CSHO ID*
- *Supervisor ID*
- *Investigation Summary ID*

Step 1: After selecting the Victim Information sub tab the following screen is displayed.

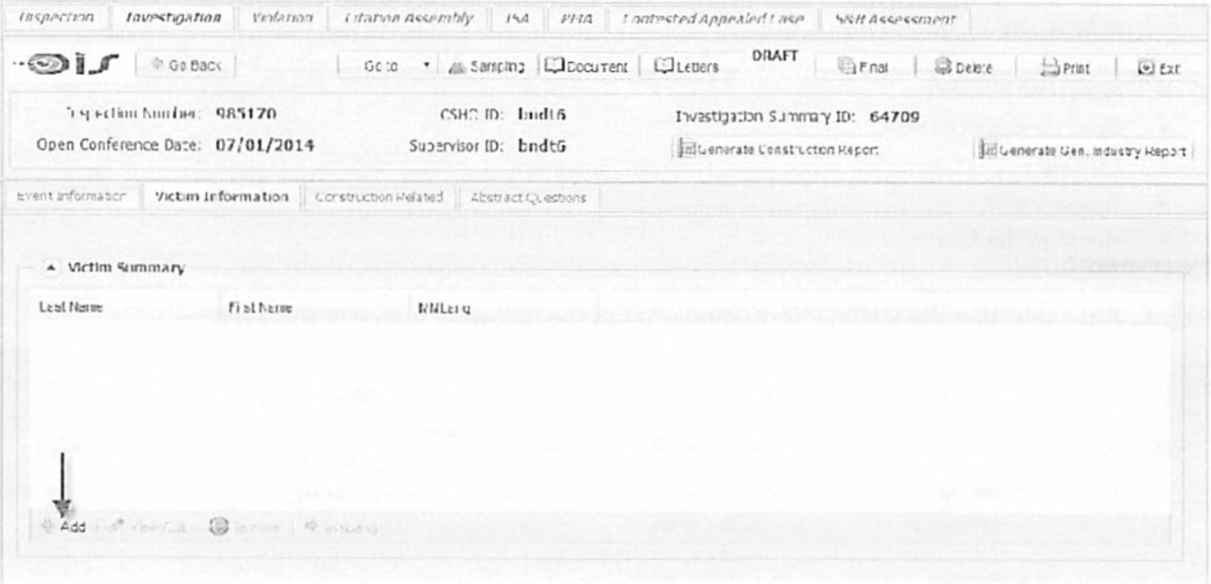

Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
DRAFT
Final
Delete
Print
Exit
Generate Construction Report
Generate Gen. Industry Report
Event Information
Victim Information
Construction Related
Abstract Questions
Victim Summary
Last Name
First Name
IMMLang
Add
View/Edit
Remove
ImmLang

Inspection Number: 985170
CSHO ID: bndt6
Investigation Summary ID: 64709
Open Conference Date: 07/01/2014
Supervisor ID: bndt6

General Description
The Victim Information sub-tab contains the following entities: Victim Summary.

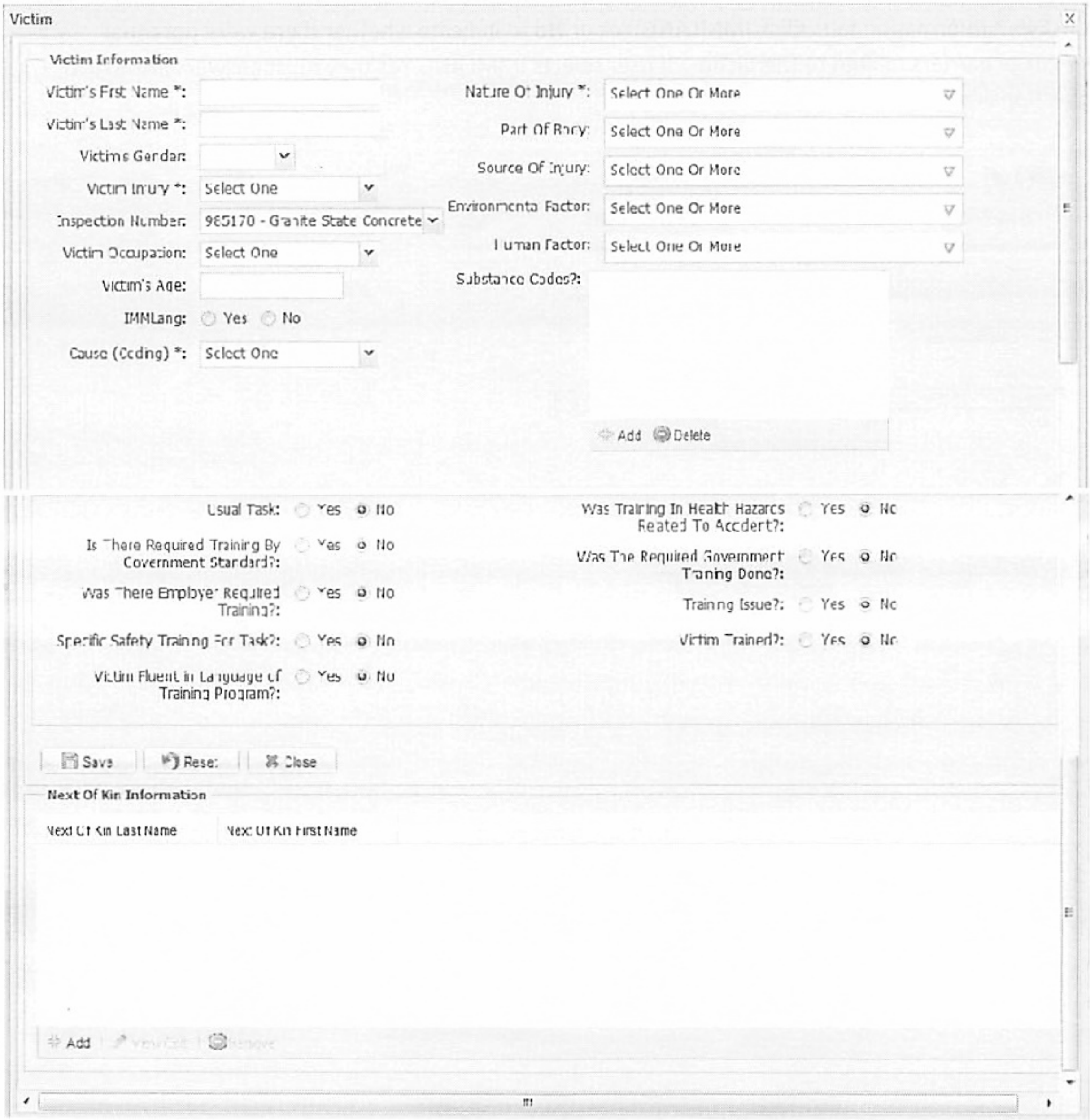
Field or Screen Element	**Comment**
Victim Summary	This is where a user can enter information about one or more Victims, including personal information, and characteristics of the injury and accident event.

Step 2: To add victim information click the **Add** button as shown below.


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
DRAFT
Final
Delete
Print
Exit
Generate Construction Report
Generate Gen. Industry Report
Event Information
Victim Information
Construction Related
Abstract Questions
Victim Summary
Last Name
First Name
NNLen q
Add
View/Edit
Remove
Undo

Inspection Number: 985170
CSHO ID: bndt6
Investigation Summary ID: 64709
Open Conference Date: 07/01/2014
Supervisor ID: bndt6

Step 3: Clicking the **Add** button will display the following screen.



Victim's First Name *:
Victim's Last Name *:
Victims Gender:
Victim Injury *: Select One
Inspection Number: 965170 - Granite State Concrete
Victim Occupation: Select One
Victim's Age:
IMMLang: ○ Yes ○ No
Cause (Coding) *: Select One

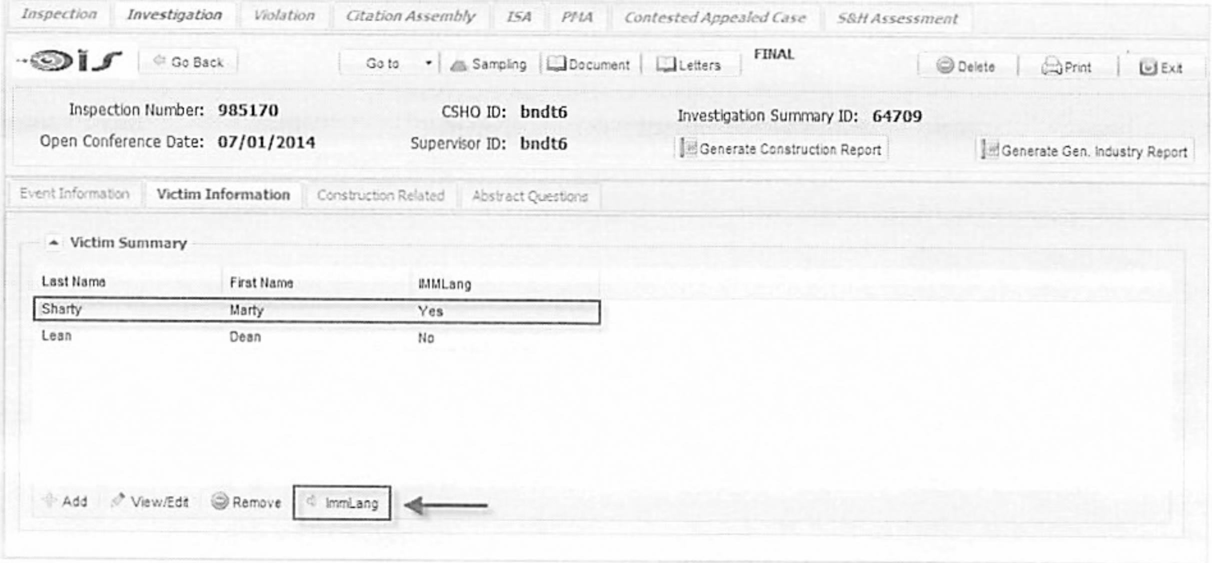
Nature Of Injury *: Select One Or More
Part Of Body: Select One Or More
Source Of Injury: Select One Or More
Environmental Factor: Select One Or More
Human Factor: Select One Or More
Substance Codes?:

Usual Task: ○ Yes ● No
Is There Required Training By Government Standard?: ○ Yes ● No
Was There Employer Required Training?: ○ Yes ● No
Specific Safety Training For Task?: ○ Yes ● No
Victim Fluent in Language of Training Program?: ○ Yes ● No

Was Training In Health Hazards Related To Accident?: ○ Yes ● No
Was The Required Government Training Done?: ○ Yes ● No
Training Issue?: ○ Yes ● No
Victim Trained?: ○ Yes ● No

Next Of Kin Last Name	Next Of Kin First Name

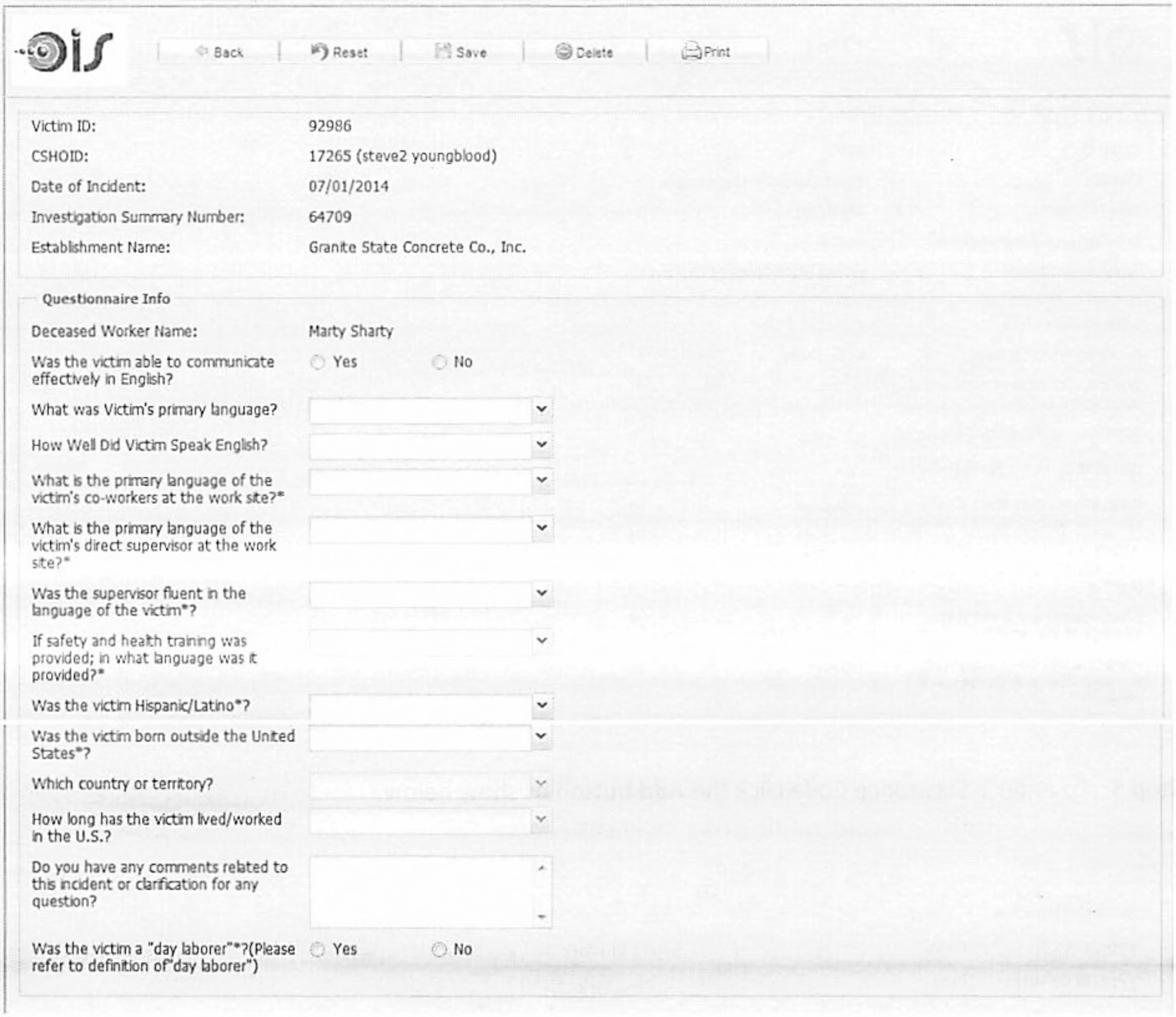
Step 4: Enter data in the Vicitim Information sub-sections. Enter data in the Victim Information sub-sections. Note that the Victim Inspection Number must have been entered as a Related Inspection on the Event Information tab. Click **IMMLANG Yes** or **No** to indicate whether there were potential language barriers related to this victim. If user selects IMMLANG Yes they must answers IMMLANG questionaire.


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
FINAL
Delete
Print
Exit
Generate Construction Report
Generate Gen. Industry Report
Event Information
Victim Information
Construction Related
Abstract Questions
Victim Summary
Add
View/Edit
Remove
ImmLang

Inspection Number: **985170**
Open Conference Date: **07/01/2014**
CSHO ID: **bndt6**
Supervisor ID: **bndt6**
Investigation Summary ID: **64709**

Last Name	First Name	IMMLang
Sharty	Marty	Yes
Lean	Dean	No

Once the victims name is highligted and ImmLand selected users will be brought to the questionaire below.

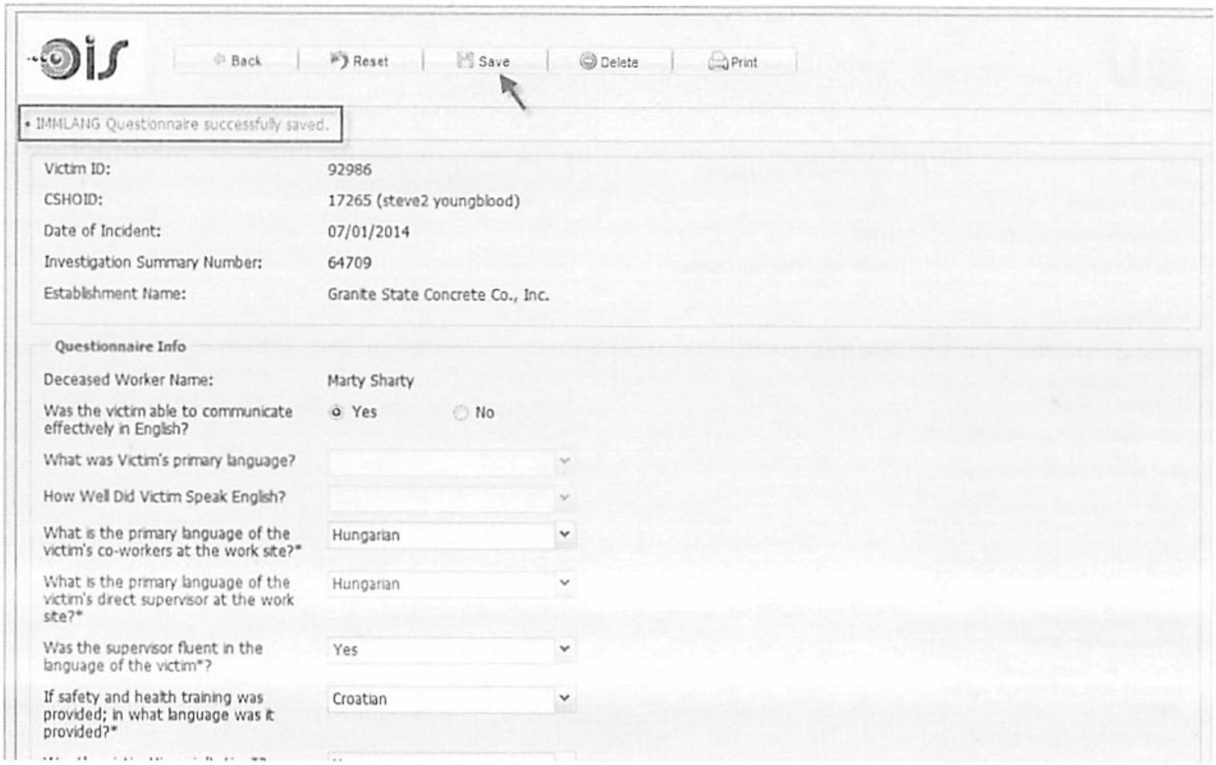


Victim ID:	92986
CSHOID:	17265 (steve2 youngblood)
Date of Incident:	07/01/2014
Investigation Summary Number:	64709
Establishment Name:	Granite State Concrete Co., Inc.

Questionnaire Info

Deceased Worker Name:	Marty Sharty
Was the victim able to communicate effectively in English?	○ Yes ○ No
What was Victim's primary language?	
How Well Did Victim Speak English?	
What is the primary language of the victim's co-workers at the work site?*	
What is the primary language of the victim's direct supervisor at the work site?*	
Was the supervisor fluent in the language of the victim*?	
If safety and health training was provided; in what language was it provided?*	
Was the victim Hispanic/Latino*?	
Was the victim born outside the United States*?	
Which country or territory?	
How long has the victim lived/worked in the U.S.?	
Do you have any comments related to this incident or clarification for any question?	
Was the victim a "day laborer"*?(Please refer to definition of"day laborer")	○ Yes ○ No

When the Immlang is completed the user should select **Save** button and then received a success message.



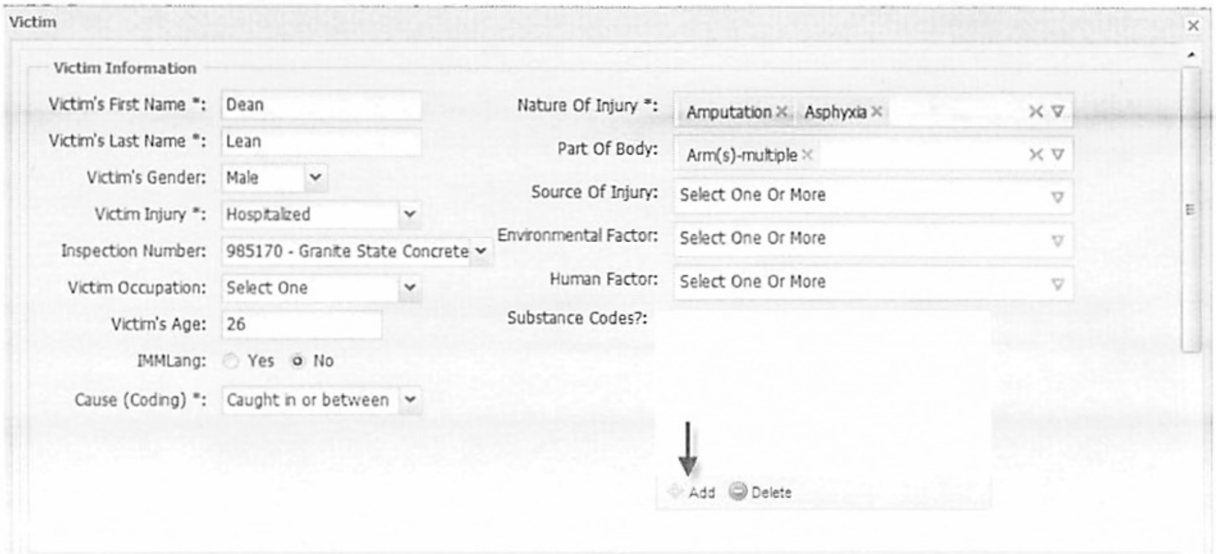
• IMMLANG Questionnaire successfully saved.

Victim ID: 92986
CSHOID: 17265 (steve2 youngblood)
Date of Incident: 07/01/2014
Investigation Summary Number: 64709
Establishment Name: Granite State Concrete Co., Inc.

Questionnaire Info

Deceased Worker Name: Marty Sharty
Was the victim able to communicate effectively in English? ● Yes ○ No
What was Victim's primary language?
How Well Did Victim Speak English?
What is the primary language of the victim's co-workers at the work site?* Hungarian
What is the primary language of the victim's direct supervisor at the work site?* Hungarian
Was the supervisor fluent in the language of the victim*? Yes
If safety and health training was provided; in what language was it provided?* Croatian

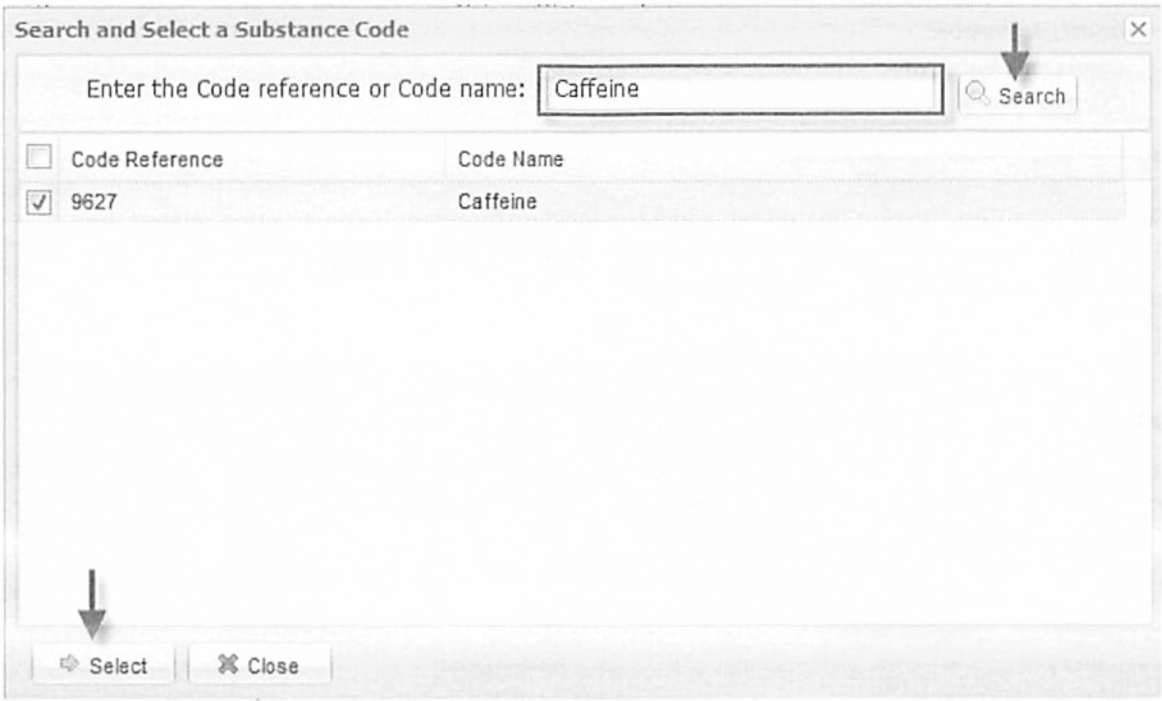
Step 5: To enter a Substance Code click the **Add** button as show below.



Victim Information

Victim's First Name *: Dean
Victim's Last Name *: Lean
Victim's Gender: Male
Victim Injury *: Hospitalized
Inspection Number: 985170 - Granite State Concrete
Victim Occupation: Select One
Victim's Age: 26
IMMLang: ○ Yes ● No
Cause (Coding) *: Caught in or between
Nature Of Injury *: Amputation, Asphyxia
Part Of Body: Arm(s)-multiple
Source Of Injury: Select One Or More
Environmental Factor: Select One Or More
Human Factor: Select One Or More
Substance Codes?:

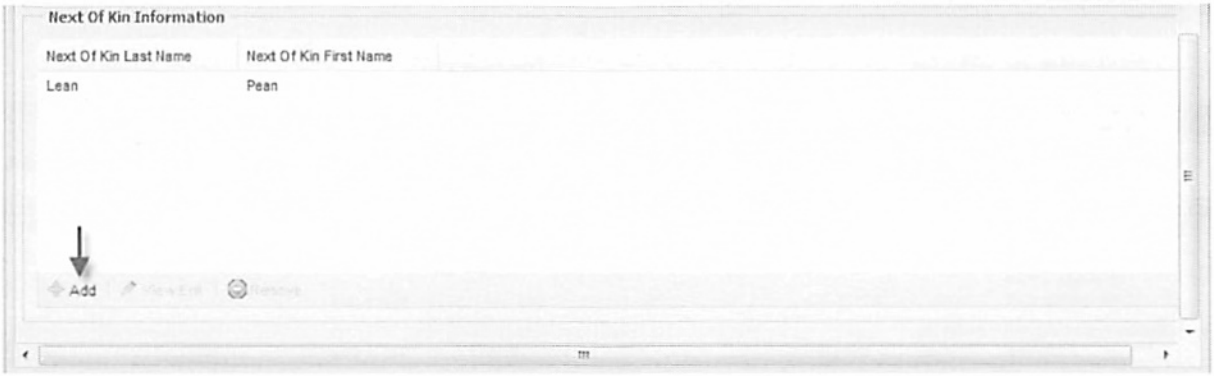
Step 6: Clicking the **Add** button will display the following screen. Enter the Code reference or Substance name, then click the **Search** button. Highlight the substance and click the **Search** button.


Search and Select a Substance Code
×
Search
Select
Close

Enter the Code reference or Code name: Caffeine

☐	Code Reference	Code Name
☑	9627	Caffeine

Step 7: To add next of kin information click the **Add** button in the Next Of Kin Information sub-section as shown below.


Next Of Kin Information
Add
View Edit
Remove

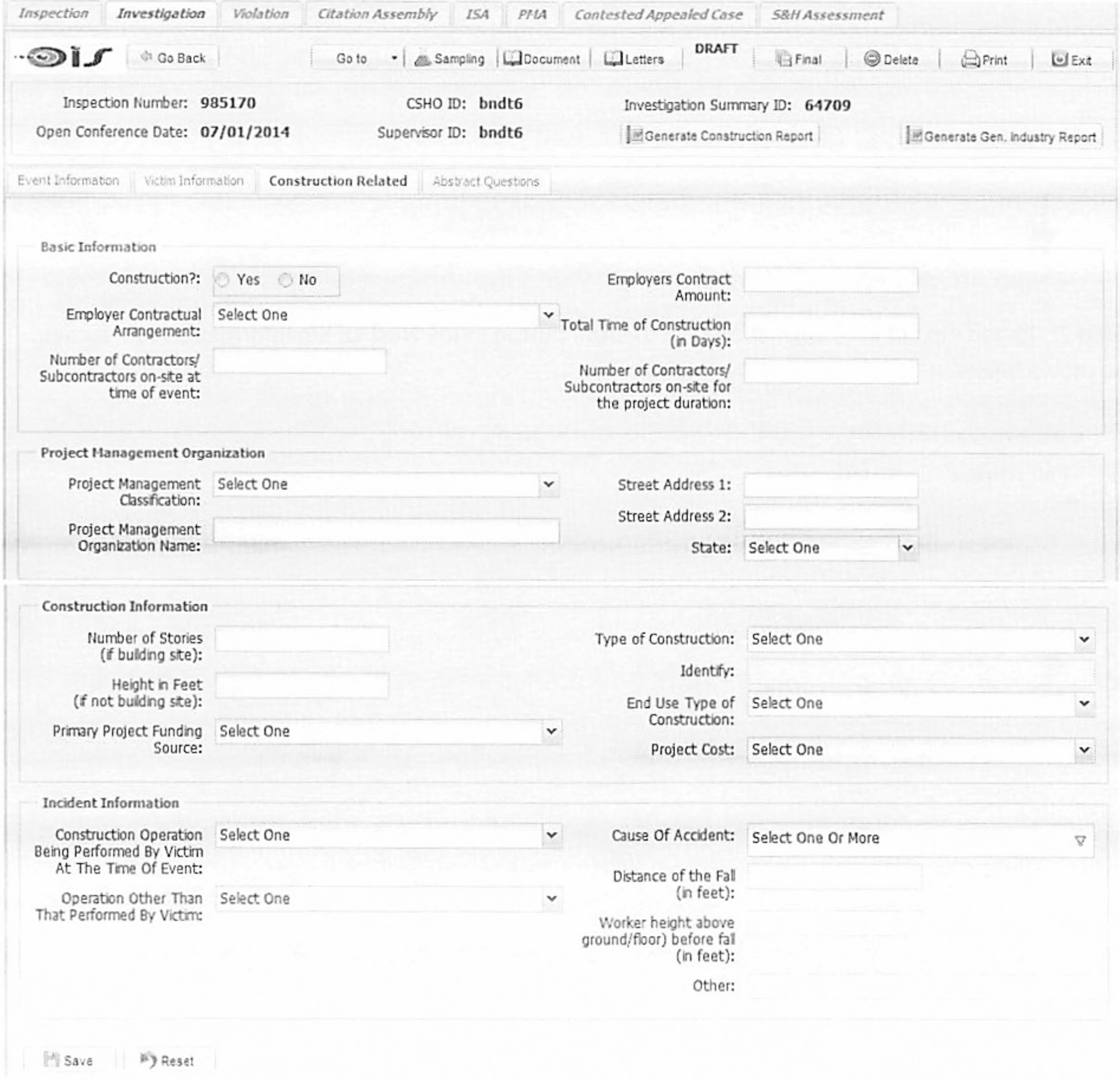
Next Of Kin Last Name	Next Of Kin First Name
Lean	Pean

1.2.3: Construction Related

By default, OIS will display the...

- *Inspection Number*
- *Open Conference Date*
- *CSHO ID*
- *Supervisor ID*
- *Investigation Summary ID*

Step 1: Select the Construction related tab and if the incident/accident is construction related then select "Yes" for the "Construction?" question. The following screen is displayed. Complete the information items as appropriate and click **Save**.


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
DRAFT
Final
Delete
Print
Exit
Generate Construction Report
Generate Gen. Industry Report
Event Information
Victim Information
Construction Related
Abstract Questions
Save
Reset

Inspection Number: **985170**
Open Conference Date: **07/01/2014**
CSHO ID: **bndt6**
Supervisor ID: **bndt6**
Investigation Summary ID: **64709**

Basic Information

Construction?: ○ Yes ○ No
Employer Contractual Arrangement: Select One
Number of Contractors/ Subcontractors on-site at time of event:
Employers Contract Amount:
Total Time of Construction (in Days):
Number of Contractors/ Subcontractors on-site for the project duration:

Project Management Organization

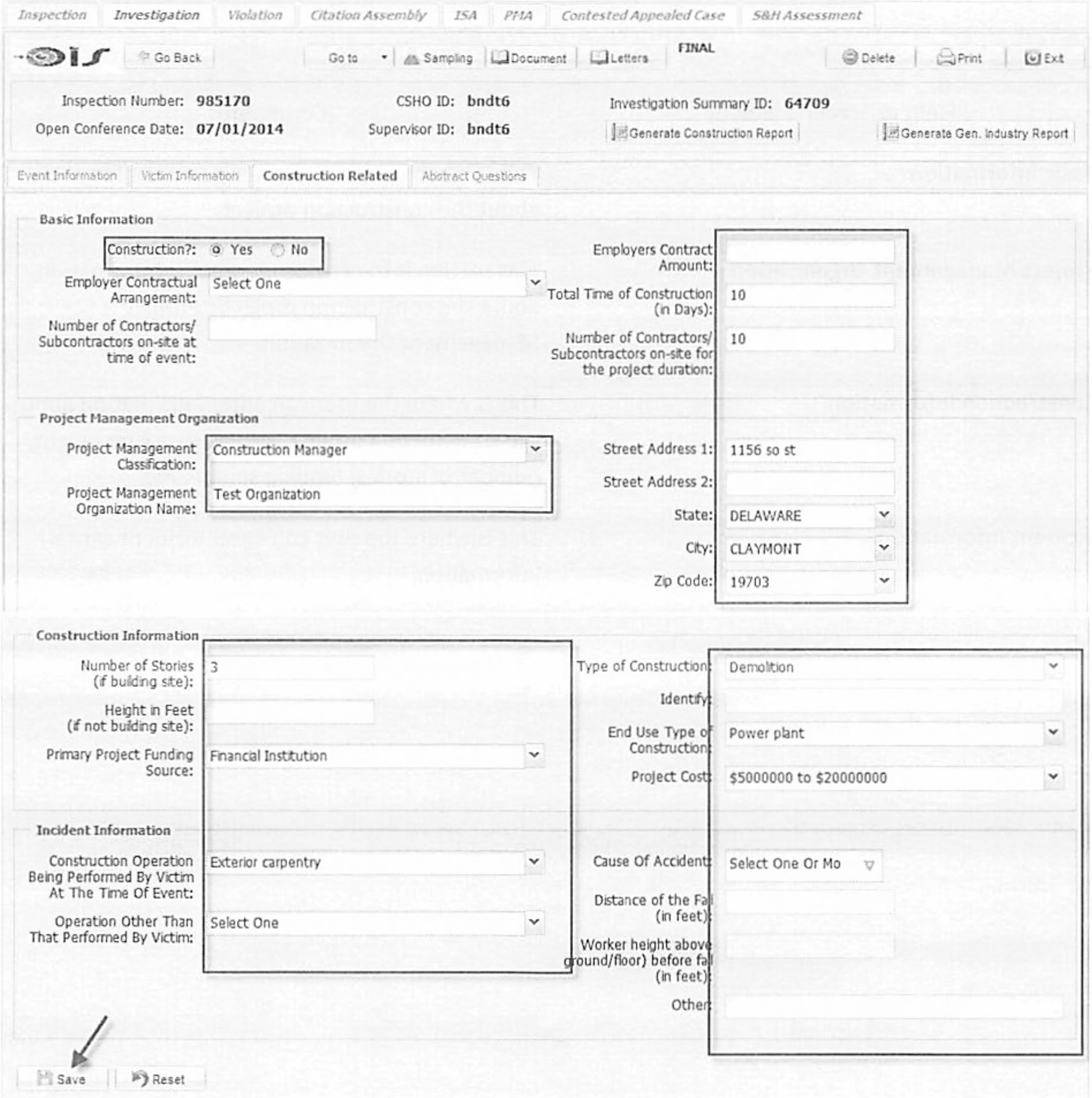
Project Management Classification: Select One
Project Management Organization Name:
Street Address 1:
Street Address 2:
State: Select One

Construction Information

Number of Stories (if building site):
Height in Feet (if not building site):
Primary Project Funding Source: Select One
Type of Construction: Select One
Identify:
End Use Type of Construction: Select One
Project Cost: Select One

Incident Information

Construction Operation Being Performed By Victim At The Time Of Event: Select One
Operation Other Than That Performed By Victim: Select One
Cause Of Accident: Select One Or More
Distance of the Fall (in feet):
Worker height above ground/floor) before fall (in feet):
Other:


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
FINAL
Delete
Print
Exit
Generate Construction Report
Generate Gen. Industry Report
Event Information
Victim Information
Construction Related
Abstract Questions
Save
Reset

Inspection Number: 985170
Open Conference Date: 07/01/2014
CSHO ID: bndt6
Supervisor ID: bndt6
Investigation Summary ID: 64709

Basic Information

Construction?: ● Yes ○ No
Employer Contractual Arrangement: Select One
Number of Contractors/ Subcontractors on-site at time of event:
Employers Contract Amount:
Total Time of Construction (in Days): 10
Number of Contractors/ Subcontractors on-site for the project duration: 10

Project Management Organization

Project Management Classification: Construction Manager
Project Management Organization Name: Test Organization
Street Address 1: 1156 so st
Street Address 2:
State: DELAWARE
City: CLAYMONT
Zip Code: 19703

Construction Information

Number of Stories (if building site): 3
Height in Feet (if not building site):
Primary Project Funding Source: Financial Institution
Type of Construction: Demolition
Identify:
End Use Type of Construction: Power plant
Project Cost: $5000000 to $20000000

Incident Information

Construction Operation Being Performed By Victim At The Time Of Event: Exterior carpentry
Operation Other Than That Performed By Victim: Select One
Cause Of Accident: Select One Or Mo
Distance of the Fa (in feet):
Worker height above ground/floor) before fa (in feet):
Other:

General Description

The Construction Related sub-tab contains the following entities: Basic Information, Project Management Organization, Construction Information, and Incident Information. This is where the user may enter additional information if the incident or accident is construction related.

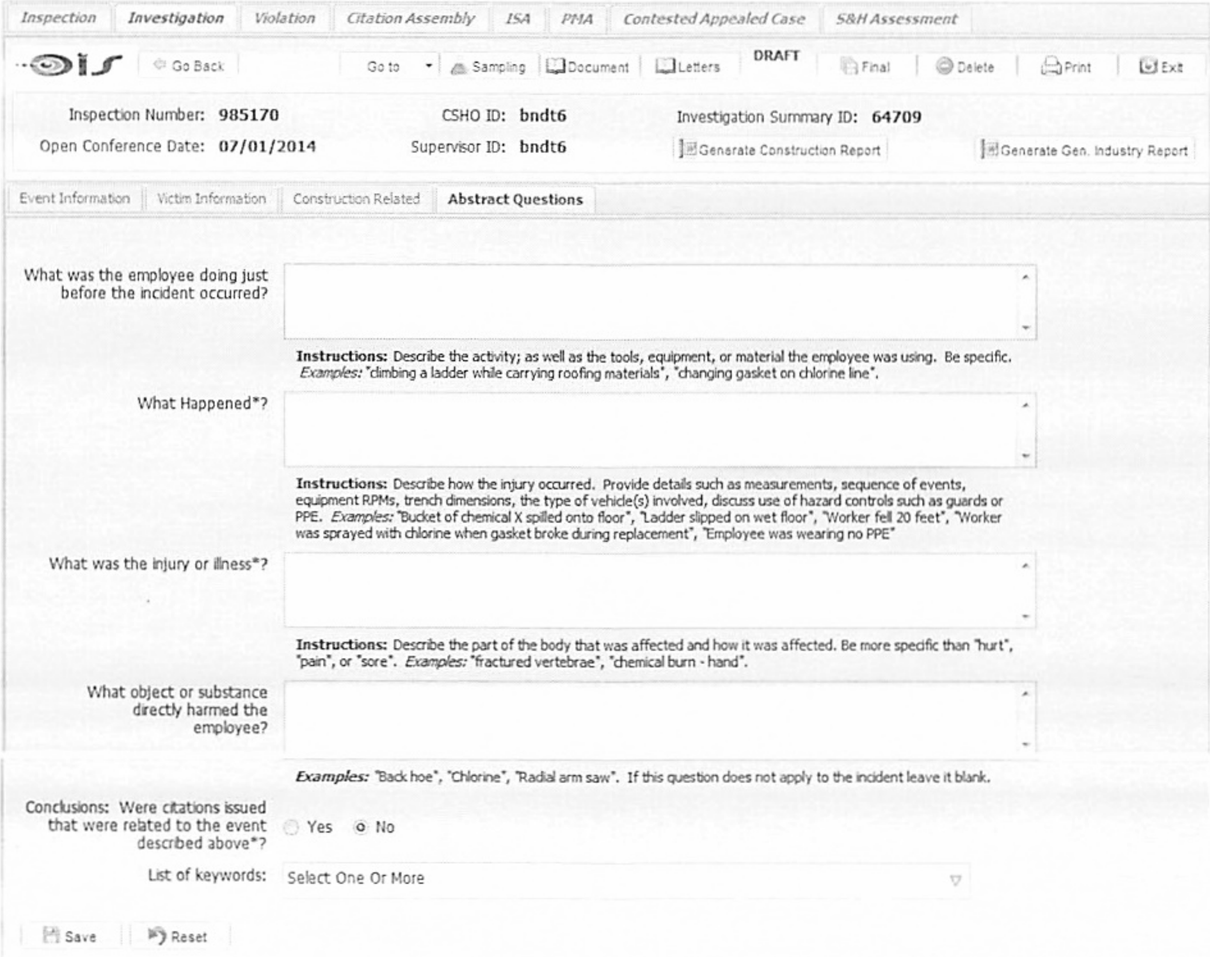
Screen Specifics	
Field or Screen Element	**Comment**
Basic Information	This is where a user can enter general information about the construction project.
Project Management Organization	This section is to provide identifying information about the construction project's Project Management Organization.
Construction Information	This is where the user can enter information about the construction project such as structure height, number of stories, funding source, etc.
Incident Information	This is where the user can enter incident causal information.

1.2.4: Abstract Questions

By default, OIS will display the...

- *Inspection Number*
- *Open Conference Date*
- *CSHO ID*
- *Supervisor ID*
- *Investigation Summary ID*

Step 1: After selecting the **Abstract Questions** sub tab the following screen is displayed. This includes the four questions designed to collect the description of the accident. The answers to the four questions constitute the event abstract. Keywords for searching the abstract are also entered here. Enter answers to the questions; select keywords appropriate for the event and then click **Save**.


Inspection
Investigation
Violation
Citation Assembly
ISA
PMA
Contested Appealed Case
S&H Assessment
Go Back
Go to
Sampling
Document
Letters
DRAFT
Final
Delete
Print
Exit
Generate Construction Report
Generate Gen. Industry Report
Event Information
Victim Information
Construction Related
Abstract Questions
Save
Reset

Inspection Number: **985170**
Open Conference Date: **07/01/2014**
CSHO ID: **bndt6**
Supervisor ID: **bndt6**
Investigation Summary ID: **64709**

What was the employee doing just before the incident occurred?

Instructions: Describe the activity; as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials", "changing gasket on chlorine line".

What Happened*?

Instructions: Describe how the injury occurred. Provide details such as measurements, sequence of events, equipment RPMs, trench dimensions, the type of vehicle(s) involved, discuss use of hazard controls such as guards or PPE. *Examples:* "Bucket of chemical X spilled onto floor", "Ladder slipped on wet floor", "Worker fell 20 feet", "Worker was sprayed with chlorine when gasket broke during replacement", "Employee was wearing no PPE"

What was the injury or illness*?

Instructions: Describe the part of the body that was affected and how it was affected. Be more specific than "hurt", "pain", or "sore". *Examples:* "fractured vertebrae", "chemical burn - hand".

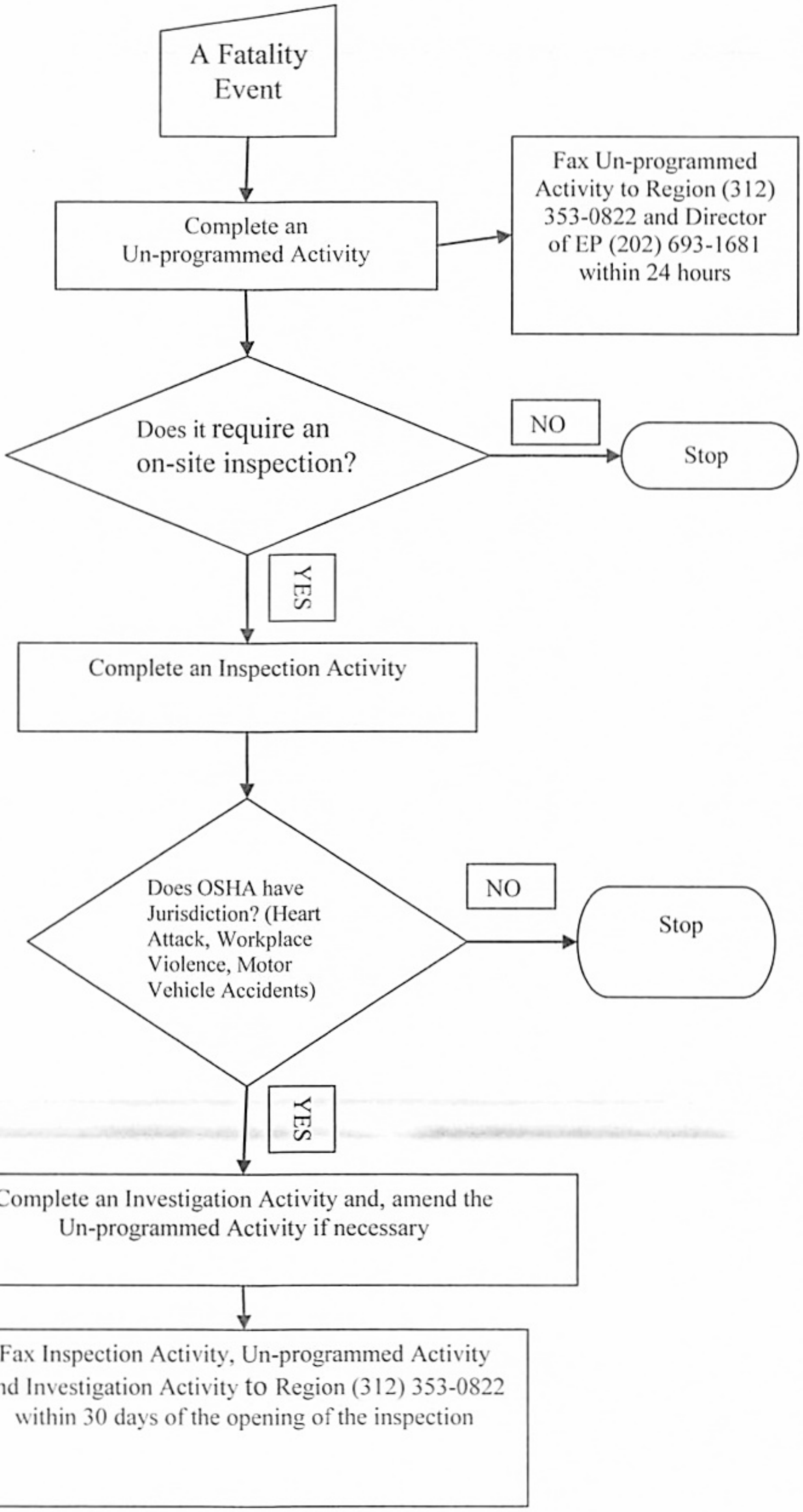
What object or substance directly harmed the employee?

Examples: "Back hoe", "Chlorine", "Radial arm saw". If this question does not apply to the incident leave it blank.

Conclusions: Were citations issued that were related to the event described above*? ○ Yes ● No

List of keywords: Select One Or More

Fatality Reporting Flow Chart


A Fatality Event
Complete an Un-programmed Activity
Fax Un-programmed Activity to Region (312) 353-0822 and Director of EP (202) 693-1681 within 24 hours
Does it require an on-site inspection?
NO
Stop
YES
Complete an Inspection Activity
Does OSHA have Jurisdiction? (Heart Attack, Workplace Violence, Motor Vehicle Accidents)
NO
Stop
YES
Complete an Investigation Activity and, amend the Un-programmed Activity if necessary
Fax Inspection Activity, Un-programmed Activity and Investigation Activity to Region (312) 353-0822 within 30 days of the opening of the inspection

APPENDIX A – OSHA 170 ABSTRACT DATA CHECKLIST

Employee/Employer Information

1. Name of Company
2. ~~SIC~~ NAICS
3. Date of event
4. Time of event
5. Information on worker(s) affected:
   a. Age
   b. Gender
   c. Nationality if applicable (NOTE: If coded IMMLANG-Y)
      i. Proficiency level speaking English
      ii. Level of understanding English
      iii. Main language of worker(s)
6. Injury sustained by worker(s)
7. Was the injured worker(s) employed by the facility owner or contracted

Task/Equipment Information

8. Task being performed by the worker
9. If there were other workers present and where were they in relation to the accident
10. Description of the accident scene
    a. Significant measurements:
       i. Depth of trenches
       ii. Height of working platform/scaffold
    b. Weather Conditions
    c. Work environment at the time of event (e.g, slippery floors, congested work area, large amount of debris, etc.)
11. Kind of equipment involved:
    a. Type of equipment
    b. Name of manufacturer
    c. Model number
12. Description of the general nature of the facility where event occurred (e.g., high-rise construction, chemical plant, petroleum refinery, warehouse, etc.)
13. Operation injured worker(s) was engaged in leading up to the event
    a. Involved in work activity
    b. Bystander

14. PPE Related to accident
15. Previous training received

Causal Information

14. Event Type

Fall
Caught-in
Exposure
Electrocution
Struck-by
Crushed
Other

Other Factors (NOTE: If it has been **verified** through autopsy or medical information obtained, that alcohol or drug use was a factor in the incident, include this information in the abstract)

Information NOT to be included in the Abstract:

- Name(s) of employees
  - Refer to multiple employees as "Employee 1," "Employee 2," etc.
- Personal medical conditions (e.g., epilepsy, HIV, etc.)
- Unconfirmed/suspected drug or alcohol use of workers
- Assumptions or theories

APPENDIX C

General Industry Fatality Abstract

ABC Grain Milling ~~SIC 2041~~ NAICS 311221
On 6-13-03, at approximately 11:10 am, a 25 year old male employee was killed when he fell into an auger at the product unloading area. He had been employed since December 15, 2002. The employee was cleaning off the bearings (from above) in the auger pit after a sticky and greasy product called meat and bone feed was unloaded from the truck. The employee was using air (100 psi) to blow off the material from the bearings and surrounding area. In the pit and above the auger were 4-5 inch pipes spaced approximately 4 inches apart. However, there were three pipes missing in a row, which had been removed to ensure that certain product types would flow into the auger. This left an opening into the auger of approximately 26" by 28". The top grate, which measured 34" by 63", was also removed in order for the material to flow into the auger. The material was greasy and sticky because of the fat content of the material and was also on the floor above the pit where the auger was located. The employee was wearing ordinary work boots and the floor was concrete. It was not clear whether this employee had ever performed this operation before, however, when it was assigned to him that morning, the employee stated that he knew how to do the job. This particular operation was performed approximately once per month. The employer did not have written standard operating procedures for this process nor had the employee received specific training on doing this job. The employer did have lockout procedures for the augers. Instructions were not given to replace the grate which had been removed during the product dump. There were two other employees in the approximate vicinity but did not see the accident take place. IMMLANG N

Chapter 11

IMMINENT DANGER, FATALITY, CATASTROPHE, AND EMERGENCY RESPONSE

I. Imminent Danger Situations.

A. General.

1. Definition of Imminent Danger.
   Section 13(a) of the OSH Act defines imminent danger as "…any conditions or practices in any place of employment which are such that a danger exists which could reasonably be expected to cause death or serious physical harm immediately or before the imminence of such danger can be eliminated through the enforcement procedures otherwise provided by this Act."
2. Conditions of Imminent Danger.
   The following conditions must be present for a hazard to be considered an imminent danger:
   a. Death or serious harm must be threatened; AND
   b. It must be reasonably likely that a serious accident could occur immediately OR, if not immediately, then before abatement would otherwise be implemented.

   NOTE: For a health hazard, exposure to the toxic substance or other hazard must cause harm to such a degree as to shorten life or be immediately dangerous to life and health (IDLH) or cause substantial reduction in physical or mental efficiency or health, though the resulting harm may not manifest itself immediately.

B. Pre-Inspection Procedures.

1. Imminent Danger Report Received by the Field.
   a. After the Area Director or designee receives a report of imminent danger, he or she will evaluate the inspection requirements and assign a CSHO to conduct the inspection.
   b. Every effort will be made to conduct the imminent danger inspection on the same day that the report is received. In any case, the inspection will be conducted no later than the day after the report is received.
   c. When an immediate inspection cannot be made, the Area Director or designee will contact the employer and obtain as many pertinent details as possible about the situation, and attempt to have any employee(s) affected by the imminent danger voluntarily removed.
      - ➢ A record of what steps, if any, that the employer intends to take, to eliminate the danger will be included in the case file.
      - ➢ This notification is considered an advance notice of inspection to be handled in accordance with the advance notice procedures described below.
2. Advance Notice.
   a. §1903.6 authorizes advance notice of an inspection of potential imminent danger situations in order to encourage employers to eliminate dangerous conditions as quickly as possible.
   b. Where an immediate inspection cannot be made after the Area Office is alerted to an imminent danger condition and advance notice will speed the elimination of

the hazard, the Team Leader or CSHO, at the direction of the Area Director, will give notice of an impending inspection to the employer.

    c. Where advance notice of an inspection is given to an employer, it shall also be given to the authorized employee representative, if present. If the inspection is in response to a formal Section 8(f)(1) complaint, the complainant will be informed of the inspection unless this will cause a delay in speeding the elimination of the hazard.

C. Imminent Danger Inspection Procedures.

All alleged imminent danger situations brought to the attention of or discovered by CSHOs while conducting any inspection will be inspected immediately. Additional inspection activity will take place only after the imminent danger condition has been resolved.

1. Scope of Inspection.

   CSHOs may consider expanding the scope of an imminent danger inspection based on additional hazards discovered or brought to their attention during the inspection.

2. Procedures for Inspection.
    a. Every imminent danger inspection will be conducted as expeditiously as possible.
    b. CSHOs will offer the employer and employee representatives the opportunity to participate in the worksite inspection, unless the immediacy of the hazard makes it impractical to delay the inspection in order to afford time to reach the area of the alleged imminent danger.
    c. As soon as reasonably practicable after discovery of existing conditions or practices constituting an imminent danger, the employer shall be informed of such hazards. The employer shall be asked to notify affected employees and to remove them from exposure to the imminent danger hazard. The employer should be encouraged to voluntarily take appropriate abatement measures to promptly eliminate the danger.

D. Elimination of the Imminent Danger.

1. Voluntary Elimination of the Imminent Danger.
    a. How to Voluntarily Eliminate a Hazard.
        - Voluntary elimination of the hazard has been accomplished when the employer:
            - Immediately removes affected employees from the danger area;
            - Immediately removes or abates the hazardous condition; and
            - Gives satisfactory assurance that the dangerous condition will remain abated before permitting employees to work in the area.
        - Satisfactory assurance can be evidenced by:
            - After removing the affected employees, immediate corrective action is initiated, designed to bring the dangerous condition, practice, means or method of operation, or process into compliance, which, when completed, would permanently eliminate the dangerous condition; or
            - A good faith representation by the employer that permanent corrective action will be taken as soon as possible, **and** that affected employees will not be permitted to work in the area of the imminent danger until the condition is permanently corrected; or
            - A good faith representation by the employer that permanent corrective action will be instituted as soon as possible. Where personal protective equipment can eliminate the imminent danger,

such equipment will be issued and its use strictly enforced until the condition is permanently corrected.

NOTE: Through on-site observations, CSHOs shall ensure that any/all representations from the employer that an imminent danger has been abated are accurate.

b. Where a Hazard is Voluntarily Eliminated.

If an employer voluntarily and completely eliminates the imminent danger without unreasonable delay:

- No imminent danger legal proceeding shall be instituted;
- The *Notice of an Alleged Imminent Danger (OSHA-8)*, does not need to be completed;
- An appropriate citation(s) and notice(s) of penalty will be proposed for issuance with an appropriate notation on the *Violation (OSHA-1B)* to document corrective actions; and
- CSHOs will inform the affected employees or their authorized representative(s) that, although an imminent danger had existed, the danger has been eliminated. They will also be informed of any steps taken by the employer to eliminate the hazardous condition.

2. Refusal to Eliminate an Imminent Danger.

a. If the employer does not or cannot voluntarily eliminate the hazard or remove affected employees from the exposure and the danger is immediate, CSHOs will immediately consult with the Area Director or designee and obtain permission to post a *Notice of an Alleged Imminent Danger (OSHA-8)*.

b. Area Directors or designees will then contact the Regional Administrator and determine whether to consult with the RSOL to obtain a Temporary Restraining Order (TRO).

c. The employer will be advised that Section 13 of the OSH Act gives United States district courts the authority to restrain any condition or practice that poses an imminent danger to employees.

NOTE: The Agency has no authority to order the closing of a worksite or to order affected employees to leave the area of the imminent danger or the workplace.

d. CSHOs will notify affected employees and the employee representative that a *Notice of an Alleged Imminent Danger (OSHA-8)* has been posted and will advise them of the Section 11(c) discrimination protections under the OSH Act. Employees will be advised that they have the right to refuse to perform work in the area where the imminent danger exists.

e. The Area Director or designee and the Regional Administrator, in consultation with the RSOL, will assess the situation and, if warranted, make arrangements for the expedited initiation of court action, or instruct the CSHO to remove the *Notice of an Alleged Imminent Danger (OSHA-8)*.

3. When Harm Will Occur Before Abatement is Required.

a. If CSHOs have clear evidence that harm will occur before abatement is required (i.e., before a final order of the Commission in a contested case or before a TRO can be obtained), they will confer with the Area Director or designee to determine a course of action.

NOTE: In some cases, the evidence may not support the finding of an imminent danger at the time of the physical inspection, but rather after further evaluation of the case file or presence of additional evidence.

b. As appropriate, an imminent danger notice may be posted at the time citations are delivered or even after the notice of contest is filed.

II. Fatality and Catastrophe Investigations.

A. Definitions.

1. Fatality.
Fatality is an employee death resulting from a work-related incident or exposure; in general, from an injury or an illness caused by or related to a workplace hazard.

2. Catastrophe.
Catastrophe is the hospitalization of three or more employees resulting from a work-related incident or exposure; in general, from an injury or an illness caused by a workplace hazard.

NOTE: OSHA Area Offices will determine the inspection priority of a **catastrophe** using the Memorandum entitled, "*Interim Enforcement Procedures for New Reporting Requirements under 29 C.F.R. 1904.39*", dated December 24, 2014, or unless superseded by future agency-approved correspondence.

3. Hospitalization.
In-patient hospitalization is the formal admission to the inpatient service of a hospital or clinic for care or treatment. It excludes admission for diagnostic testing or observation only.

4. Incident Requiring a Coordinated Federal Response.
An incident involving multiple fatalities, extensive injuries, massive toxic exposures, extensive property damage, or one that presents potential employee injury and generates widespread media interest.

NOTE: 29 CFR Part 1904 has new requirements for reporting work-related fatalities, hospitalizations, amputations or losses of an eye. The new rule, which also updates the list of employers partially exempt from OSHA record-keeping requirements, went into effect on January 1, 2015, for workplaces under federal OSHA jurisdiction. (See 79 FR 56129, Occupational Injury and Illness Recording and Reporting Requirements – NAICS Update and Reporting Revisions, September 18, 2014.)

B. Initial Report.

1. The *Fatality/Catastrophe Form (FAT/CAT)* is a pre-inspection form that must be completed for all fatalities or catastrophes unless knowledge of the event occurs during the course of an inspection at the establishment involved. The purpose of the *FAT/CAT (OSHA-36)* is to provide OSHA with enough information to determine whether or not to investigate the event. It is also used as a research tool by OSHA and other agencies.

2. If, after the initial report, the Area Office becomes aware of information that affects the decision to investigate, the *FAT/CAT (OSHA-36)* should be updated. If the additional information does not affect the decision to investigate, or the investigation has been initiated or completed, the *FAT/CAT (OSHA-36)* need not be updated. After updating the *FAT/CAT (OSHA-36)*, it should be resubmitted to the National Office.

3. See additional details on completing the *FAT/CAT (OSHA-36)* in Section II.I., of this chapter, *Recording and Tracking for Fatality/Catastrophe Inspections.*

C. Investigation Procedures.

1. All fatalities and catastrophes will be thoroughly investigated in an attempt to determine the cause of the event, whether a violation of OSHA safety and health standards, regulations, or the general duty clause occurred, and any effect the violation had on the incident. Each Regional Administrator will establish a procedure

to ensure that each fatality or catastrophe is thoroughly investigated and processed in accordance with established policy.

2. The investigation should be initiated as soon as possible after receiving an initial report of the incident, ideally within one working day, by an appropriately trained and experienced compliance officer assigned by the Area Director or designee. The Area Director or designee determines the scope of the fatality/ catastrophe investigation. All investigations must be completed in an expeditious manner.
3. Inspections following fatalities or catastrophes should include video recording as a method of documentation and gathering evidence when appropriate. The use of photography is also encouraged in documenting and gathering evidence.
4. As in all inspections, under no circumstances should OSHA personnel conducting fatality/catastrophe investigations be unprotected against a hazard encountered during the course of an investigation. OSHA personnel must use appropriate personal protective equipment and take all necessary precautions to avoid and/or prevent occupational exposure to potential hazards that may be encountered.

D. Interview Procedures.

1. Identify and Interview Persons.
    a. Identify and interview all persons with firsthand knowledge of the incident, including first responders, police officers, medical responders, and management, as early as possible in the investigation. The sooner a witness is interviewed, the more accurate and candid the witness statement will be.
    b. If an employee representative is actively involved in the inspection, he or she can serve as a valuable resource by assisting in identifying employees who might have information relevant to the investigation.
    c. Conduct employee interviews privately, outside the presence of the employer. Employees are not required to inform their employer that they provided a statement to OSHA.
    d. When interviewing:
        - Properly document the contact information of all parties because follow-up interviews with a witness are sometimes necessary.
        - When appropriate, reduce interviews to writing and have the witness sign the document. Transcribe video and audio recorded interviews and have the witness sign the transcription.
        - Read the statement to the witness and attempt to obtain agreement. Note any witnesses' refusal to sign or initial his/her statement.
        - Ask the interviewee to initial any changes or corrections made to his/her statement.
        - Advise interviewee of OSHA whistleblower protections.
    e. See Chapter 3, *Inspection Procedures*, for additional information on conducting interviews.
2. Informer's Privilege.
    a. The informer's privilege allows the government to withhold the **identity** of individuals who provide information about the violation of laws, including OSHA rules and regulations. The identity of witnesses will remain confidential to the extent possible. However, inform each witness that disclosure of his/her identity may be necessary in connection with enforcement or court actions.
    b. The informer's privilege also protects the contents of statements to the extent that disclosure would reveal the witness' identity. When the contents of a statement will not disclose the identity of the informant (i.e., statements that do not reveal

the witness' job title, work area, job duties, or other information that would tend to reveal the individual's identity), the privilege does not apply and such statements may be released.

c. Inform each witness that his/her interview statements may be released if he or she authorizes such a release or if he or she voluntarily discloses the statement to others, resulting in a waiver of the privilege.

d. Inform witnesses in a tactful and nonthreatening manner that making a false statement to a CSHO during the course of an investigation could be a criminal offense. Making a false statement, upon conviction, is punishable by a fine of up to $10,000 or six months in jail, or both.

E. Investigation Documentation.

Document all fatality and catastrophe investigations thoroughly.

1. Personal Data – Victim.

Potential items to be documented include: Name; Address; Email address; Telephone; Age; Sex; Nationality; Job Title; Date of Employment; Time in Position; Job being done at the time of the incident; Training for job being performed at the time of the incident; Employee deceased/injured; Nature of injury – fracture, amputation, etc.; and Prognosis of injured employee.

2. Incident Data.

Potential items to be documented include: How and why did the incident occur; the physical layout of the worksite; sketches/ drawings; measurements; video/audio/photos to identify sources, and whether the accident was work-related.

3. Equipment or Process Involved.

Potential items to be documented include: Equipment type; Manufacturer; Model; Manufacturer's instructions; Kind of process; Condition; Misuse; Maintenance program; Equipment inspection (logs, reports); Warning devices (detectors); Tasks performed; How often equipment is used; Energy sources and disconnecting means identified; and Supervision or instruction provided to employees involved in the incident.

4. Witness Statements.

Potential witnesses include: the Public; Fellow employees; Management; Emergency responders (e.g., police department, fire department); and Medical personnel (e.g., medical examiner).

5. Safety and Health Program.

Potential questions include:

- Does the employer have a safety and/or health program?
- Does the program address the type of hazard that resulted in the fatality/catastrophe?
- How are the elements of the program specifically implemented at the worksite?

6. Multi-Employer Worksite.

Describe the contractual and in practice relationships of the employer with the other employers involved with the work being performed at the worksite.

7. Records Request.

Potential records include: Disciplinary Records; Training Records; and Next of Kin information.

NOTE: Next of kin information should be gathered as soon as possible to ensure that condolence letters can be sent in a timely manner.

F. Potential Criminal Penalties in Fatality and Catastrophe Cases.

1. Criminal Penalties.
    a. Section 17(e) of the OSH Act provides criminal penalties for an employer who is convicted of having willfully violated an OSHA standard, rule or order when the violation results in the death of an employee. However, Section 17(e) does not apply to violations of the general duty clause. When there are violations of an OSHA standard, rule or order, or a violation of the general duty clause, criminal provisions relating to false statements and obstruction of justice may also be relevant.
    b. The circumstances surrounding all occupationally-related fatalities will be evaluated to determine whether the fatality was caused by a willful violation of a standard, thus creating the basis for a possible criminal referral. The evidence obtained during a fatality investigation is of paramount importance and must be carefully gathered and considered.
    c. Early in the investigation, the Area Director or designee, in consultation with the investigator, should make an initial determination as to whether there is potential for a criminal violation. The decision will be based on consideration of the following:
        - A fatality has occurred.
        - There is evidence that an OSHA standard has been violated and that the violation contributed to the death.
        - There is reason to believe that the employer was aware of the requirements of the standard and knew it was in violation of the standard, or that the employer was plainly indifferent to employee safety.
        - If the Regional Administrator agrees with the Area Director or designee's assessment of the case, the Regional Administrator will notify the RSOL at the discretion of the Regional Administrator and the Area Director or designee, and dependent upon Regional procedures in place, a Regional team or trained criminal investigator may assist in or perform portions of an investigation.
        - When there is a potential criminal referral in a case, it is essential that the Regional Administrator and/or the Area Director involve the RSOL's Office in the early stages of the investigation particularly during the evidence-gathering process.
2. Additional Prosecution.

    In addition to criminal prosecution under Section 17(e) of the OSH Act, employers may face prosecution under a number of other sections of the United States Code, including, but not limited to:
    a. Crimes and Criminal Procedures, for actions such as conspiracy, making false statements, fraud, obstruction of justice, and destruction, alteration or falsification of records during a federal investigation.
    b. The Clean Water Act.
    c. The Clean Air Act.
    d. The Resource Recovery and Conservation Act (RCRA).
    e. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
3. Procedures for Criminal Referral.

    When a case is forwarded from the Regional Office to the RSOL for criminal review, advise the Director of Enforcement Programs (or, when appropriate, the Director of

Construction Programs). Provide follow-up reports to indicate any subsequent actions.

G. Families of Victims.

1. Contacting Family Members.

Family members of employees involved in fatal or catastrophic occupational injuries or illnesses shall be contacted early in the investigation and given the opportunity to discuss the circumstances of the injury or illness. OSHA staff contacting family members must exercise tact and good judgment in their discussions.

See CPL 02-00-153, Communicating OSHA Fatality Inspection Procedures to a Victim's Family, dated April 17, 2012, for additional information.

2. Information Letter.

The standard information letter will normally be sent to the individual(s) listed as the emergency contact on the victim's employment records (if available) and/or the otherwise determined next of kin within 5 working days of determining the victim's identity and verifying the proper address where communications should be sent.

NOTE: In some circumstances, it may not be appropriate to follow these exact procedures; i.e., in the case of a small business, the owner or supervisor may be a relative of the victim. Modify the form letter to take into account any special circumstances or do not send the letter, as appropriate.

3. Letter to Victim's Emergency Contact.

In addition to the standard information letter sent by the Area Director or designee, the Assistant Secretary also sends a letter to the victim's emergency contact or otherwise verifiable next of kin.

Effectively immediately, all Area Offices must send a brief two to three sentence description of the incident that resulted in the fatality. This description should be sent via email and accompany the Assistant Secretary next of kin letter when it is transmitted to the national office.

In cases presenting language concerns, the Area Office should inquire as to the primary language of the next of kin. If it has been verified that the primary language of the next of kin is Spanish and not English, the Area Office will advise the national office concerning this and specify that a Spanish language letter should also be sent.

Additionally, in situations where it is not immediately possible to determine the primary language of the next of kin recipient of the fatality letter, or in instances where it has been determined that a primary language other than English or Spanish is spoken by the next of kin this should also be communicated to the national office. Unofficial translation of the fatality letter into other languages may be available.

The national office will send a Spanish language letter in addition to the English letter for Spanish-speaking next of kin recipients. All foregoing information relative to language concerns should be sent via email and accompany the Assistant Secretary next of kin letter when it is transmitted to the national office.

4. Interviewing the Family.

   a. When taking a statement from families of the victim(s), explain that the interview will be handled following the same procedures as those in effect for witness interviews. Sensitivity and professionalism are required during these interviews. Carefully evaluate the information received and attempt to corroborate it during the investigation.

   b. Maintain follow-up contact with key family members or other contact persons so that these parties can be kept up-to-date on the status of the investigation. Provide family members or their legal representatives with a copy of all citations, subsequent settlement agreements or Review Commission decisions as these are issued, or as soon thereafter as possible. However, such information will only be provided to family members after it has been provided to the employer.

c. The releasable portions of the case file will not be made available to family members until after the contest period has passed and no contest has been filed. If a contest is filed, the case file will not be made available until after the litigation is completed. Additionally, if a criminal referral is under consideration or has been made, the case file may not be released to the family. Notify the family of these policies and inform them that this is necessary so that any potential litigation is not compromised.

5. Post-Inspection Communications [With Next of Kin].

After the inspection, OSHA will make every effort to contact the next of kin via telephone to explain findings, address any questions and give the family an opportunity to provide input. Depending on the case, OSHA may issue a press release. If a press release is planned, OSHA will make every attempt to notify the family by telephone before the information is released to the public. OSHA will also provide a copy of the press release to the family.

H. Public Information Policy.

OSHA's public information policy regarding response to fatalities and catastrophes is to explain the Federal presence to the news media; not to issue periodic updates on the progress of the investigation. The Area Director and his or her designee normally will handle response to media inquiries.

I. Recording and Tracking for Fatality/Catastrophe Investigations.

1. Fatality/Catastrophe Form (FAT/CAT).

The *FAT/CAT (OSHA-36)* is a pre-inspection form that must be completed for all fatalities and catastrophes unless knowledge of the event occurs during the course of an inspection at the establishment involved. Processing of the *FAT/CAT (OSHA-36)* shall be as follows:

a. The Area Office will complete and enter into OIS a *FAT/CAT (OSHA-36)* for all fatalities and catastrophes as soon as possible after learning of the event. As much information as is known at the time of the initial report should be provided; however, all items on the *FAT/CAT (OSHA-36)* need not be completed at the time of this initial report. Wherever possible, the age of the victim(s) should be provided, because this information is used for research by OSHA and other agencies.

b. If additional information relating to the event becomes available that affects the decision to investigate, the *FAT/CAT (OSHA-36)* should be updated.

c. In addition, the Regional Administrator will contact the Deputy Director of Enforcement Programs (or Construction, as appropriate) to ensure prompt notification of the National Office of major events, such as those likely to generate significant public or congressional interest.

2. Investigation (OSHA-170).

a. The *Investigation (OSHA-170)* is used to summarize the results of investigations of all events that involve fatalities, catastrophes, amputations, hospitalizations of two or more days, have generated significant publicity, and/or have resulted in significant property damage. An *Investigation (OSHA-170)* must be opened, logged into OIS, and saved as final as soon as the agency becomes aware of a workplace fatality and determines that it is within its jurisdiction, even if most of the data fields are left blank. The information on this form enables the Agency to track fatalities and summarizes circumstances surrounding the event.

NOTE: The two-day hospitalization criterion is a cutoff to preclude completing an *Investigation (OSHA-170)* for events that may not be serious. There is no relationship between this criterion and the definition of hospitalization in Section II.A., of this chapter, Definitions.

b. For fatality/catastrophe investigations, the *Investigation (OSHA-170)* will be:
   - ➢ Opened in OIS at the beginning of the investigation and saved as *final*, even if most of the data fields are left blank, so that the Agency can track fatality/catastrophe investigations in a close to "real time" fashion.
   - ➢ Modified as needed during the investigation to account for updated information.
   - ➢ Updated with all data fields completely and accurately completed at the conclusion of the investigation, including a thorough narrative description of the incident.

c. The *Investigation (OSHA-170)* narrative should not be a copy of the summary provided on the *FAT/CAT (OSHA-36)* pre-inspection form. The narrative must comprehensively describe the characteristics of the worksite; the employer and its relationship with other employers, if relevant; the employee task/activity being performed; the related equipment used; and other pertinent information in enough detail to provide a third party reader of the narrative with a mental picture of the fatal incident and the factual circumstances surrounding the event.

d. In addition, a single fatality or catastrophe event shall normally result in only one fatality [catastrophe] inspection of the employer of the deceased employee(s) [injured employees], but one event at a multi-employer work site may possibly lead to one or more unprogrammed- related inspection(s) of other involved employers. The exception to this would occur if an event involves multiple fatalities of workers of two or more employers, resulting in more than one fatality inspection.

EXAMPLE 11-1: A fatality occurs in employer's facility in August. Both a safety and health inspection are initiated. One *Investigation (OSHA-170)* should be filed to summarize the results of the inspections that resulted from the August fatality. However, in September, while the employer's facility is still undergoing the inspections, a second fatality occurs. In this case, a second *Investigation (OSHA-170)* should be submitted for the second fatality and an additional inspection should be opened.

3. Immigrant Language Questionnaire (IMMLANG).

a. The IMMLANG Questionnaire is designed to allow the Agency to track fatalities among Spanish-speaking and other immigrant employees and to assess the impact of potential language barriers and training deficiencies on fatal incidents. Information for this questionnaire should be collected as early in the investigation as possible, as the availability of immigrant workers for questioning later in the process is often uncertain.

b. The IMMLANG Questionnaire shall be completed before the conclusion of a fatality investigation according to the procedures outlined in the Memorandum on *Change to the Interim Procedure for Fatality Investigations (IMMLANG)*, for Regional Administrators from R. Davis Layne, Deputy Assistant Secretary, dated December 16, 2003. It should be completed only if "IMMLANG-Y" is indicated on the *Inspection (OSHA-1)* (N-10 Additional Codes). The Questionnaire is not to be completed if "IMMLANG-N" is indicated on the *Inspection (OSHA-1)*.

c. The IMMLANG Questionnaire shall be submitted via OIS. A copy of the completed questionnaire should be printed and placed in the case file.

4. Related Event Code (REC).
   The *Violation (OSHA-1B)* provides specific supplemental information documenting hazards and violations. If any item cited is directly related to the occurrence of the fatality or catastrophe, select FAT/CAT/Accident. If multiple related event codes apply, the only code that has priority over relation to a fatality/catastrophe is imminent danger.

J. Pre-Citation Review.

1. Because cases involving a fatality may result in civil or criminal enforcement actions, the Area Director is responsible for reviewing all fatality and catastrophe investigation case files to ensure that the case has been properly developed and documented in accordance with the procedures outlined here.
2. The Area Director is responsible for ensuring that an *Investigation (OSHA-170)* is reported to OIS for each incident (see Section II.I.2., of this chapter, *Investigation (OSHA-170))*.
3. Review all proposed violation-by-violation penalties in accordance with CPL 02-00-080, *Handling of Cases to be Proposed for Violation-by-Violation Penalties*, dated October 21, 1990.
4. Review citations covered by Regional OSHA/SOL workload agreements in accordance with those agreements.
5. Each Regional Administrator should establish a procedure to ensure that each fatality or catastrophe is thoroughly investigated and processed in accordance with established policy.

K. Post-Citation Procedures/Abatement Verification.
The regulation governing abatement verification is found at §1903.19, and OSHA's enforcement policies and procedures for this regulation are outlined in Chapter 7, Post-Citation Procedures and Abatement Verification.

1. Due to the transient nature of many of the worksites where fatalities occur and because the worksite may be destroyed by the catastrophic event, it is frequently impossible to conduct follow-up inspections. In such cases, the Area Director should obtain abatement verification from the employer, along with an assurance that appropriate safety and health programs have been implemented to prevent the hazard(s) from recurring.
2. While site closure due to the completion of the cited project is an acceptable method of abatement, it can only be accepted as abatement without certification where a CSHO directly verifies that closure; otherwise, certification by the employer is required. Follow-up inspections need not be conducted if the CSHO has verified abatement during the inspection or if the employer has provided other proof of abatement.
3. Where the worksite continues to exist, OSHA will normally conduct a follow-up inspection if serious citations have been issued.
4. Include abatement language and safety and health system implementation language in any subsequent settlement agreement.
5. If there is a violation that requires abatement verification, field 22 on the *Violation (OSHA-1B)* must be completed with the date of abatement verified.

6. If the case is a Severe Violator Enforcement Program (SVEP) case, follow-up inspections will be conducted in accordance with OSHA Instruction CPL 02-00-149, *Severe Violator Enforcement Program (SVEP)*, June 18, 2010. Follow-up inspections will normally be conducted even if abatement of cited violations has been verified through abatement verification.

L. Audit Procedures.

The following procedures will be implemented to evaluate compliance with, and the effectiveness of, fatality/catastrophe investigation procedures:

1. Regional Offices will incorporate the review and analysis of fatality/catastrophe files into their audit functions and include their findings in the regular audit reports to the National Office. The review and analysis will use random case files to address the following:
    a. Inspection Findings.
    Ensure that hazards have been appropriately addressed and violations have been properly classified. Also ensure that criminal referrals are made when appropriate.
    b. Documentation.
    Ensure that the *Investigation (OSHA-170)* narrative and data fields and the *Violation (OSHA-1B)* narrative have been completed accurately and detailed enough to allow for analysis at the national level of the circumstances of fatal incidents. Ensure that the IMMLANG Questionnaire is completed, if relevant.
    c. Construction Fatalities.
    Ensure that the case file has been copied and forwarded to the University of Tennessee in accordance with the Memoranda on *Construction Fatality Case Study, Reasons and Methodology*, for Regional Administrators from H. Berrien Zettler, Deputy Director, D.O.C. (via email), regarding transmittal of information on construction fatalities to the University of Tennessee, dated September 12 & 13, 2000 and a Memorandum on *Construction Fatality Investigation Case Files*, for Regional Administrators from R. Davis Layne, Deputy Assistant Secretary, regarding transmittal of information on construction fatalities to the University of Tennessee, dated May 14, 2003 and February 18, 2004.
    d. Settlement Terms.
    Ensure that settlement terms are appropriate, including violation reclassification, penalty reductions, and additional abatement language.
    e. Abatement Verification.
    Ensure that abatement verification has been obtained.
    f. OIS Reports.
    Review OIS reports to identify any trends or cases that may indicate that a further review of those cases may be necessary.

M. Relationship of Fatality and Catastrophe Investigations to Other Programs and Activities.

1. Homeland Security.
OSHA's *National Emergency Management Plan (NEMP)*, as contained in HSO 01-00-001, dated December 18, 2003, clarifies the procedures and policies for OSHA's National Office and Regional Offices during responses to incidents of national significance. Generally, OSHA will provide technical assistance and consultation in coordinating the protection of response worker and recovery worker safety and health. When the President makes an emergency declaration under the Stafford Act, the National Response Framework (NRF) is activated. The NEMP can then be activated by the Assistant Secretary, the Deputy Assistant Secretary, or by request

from a Regional Administrator. Whether OSHA will conduct a formal fatality or catastrophe investigation in such a situation will be determined on a case-by-case basis.

2. Severe Violator Enforcement Program.
   a. Inspections that result in citations being issued for at least one of the following are considered Severe Violator Enforcement Program (SVEP) cases:
      - A fatality/catastrophe inspection in which OSHA finds one or more willful or repeated violations or failure-to-abate notices based on a serious violation related to a death of an employee or three or more hospitalizations;
      - An inspection in which OSHA finds two or more willful or repeated violations or failure-to-abate notices (or any combination of these violations/notices), based on high gravity serious violations related to a High-Emphasis Hazard as defined in Section XII., of OSHA Instruction CPL 02-00-149, Severe Violator Enforcement Program (SVEP), June 18, 2010;
      - An inspection in which OSHA finds three or more willful or repeated violations or failure-to-abate notices (or any combination of these violations/notices), based on high gravity serious violations related to hazards due to the potential release of a highly hazardous chemical, as defined in the PSM standard; or
      - All egregious (e.g., per-instance citations) enforcement actions.

   b. In such cases, the instructions outlined in OSHA Instruction CPL 02-00-149, *Severe Violator Enforcement Program (SVEP)*, June 18, 2010, shall be followed to ensure that the proper measures are taken regarding classification, coding and treatment of the case.

      NOTE: See Memorandum entitled, "*Inclusion of Upstream Oil and Gas Hazards to the High-Emphasis Hazards in the Severe Violator Enforcement Program (SVEP)*", dated February 11, 2015, for policy relating to the addition of upstream oil and gas hazards to the list of High-Emphasis Hazards in the Severe Violator Enforcement Program (SVEP).

3. Significant Enforcement Cases.
   Significant enforcement cases are defined as inspection cases with initial proposed penalties over $100,000 or which involve novel enforcement issues, including federal agency cases, regardless of penalty. An inspection resulting from an employee fatality or a workplace catastrophe may well be a significant enforcement case and, therefore, particularly thorough documentation is necessary to sustain legal sufficiency. (See Memorandum entitled, "Clarification of September 27, 2012 Memo on Significant Case Procedures.")

4. Special Emphasis Programs.
   If a fatality or catastrophe investigation arises at an establishment that is also in the current inspection cycle to receive a programmed inspection under any Site-Specific Targeting program, the investigation and the inspection may be conducted either concurrently or separately.

5. Cooperative Programs.
   If a fatality or catastrophe occurs at a worksite operating under OSHA's Voluntary Protection Program (VPP), the OSHA Strategic Partnership Program (OSPP) site, or OSHA's Safety and Health Achievement Recognition Program (SHARP), the Regional VPP Manager, OSPP Coordinator, or Consultation Project Manager, as well as the Director of the Directorate of Cooperative and State Programs, should be notified. When enforcement activity has concluded, the Regional VPP Manager,

OSPP Coordinator, or Consultation Project Manager should be informed so that the site can be reviewed for program issues.

N. Special Issues Related to Workplace Fatalities.

1. Death by Natural Causes.
   Workplace fatalities that are attributed to natural causes, including heart attacks, must be reported by the employer. The Area Director will then decide whether to investigate the incident.
2. Workplace Violence.
   As with heart attacks, fatalities caused by incidents of workplace violence must be reported to OSHA by the employer. The Area Director or designee will determine whether or not the incident will be investigated.
3. Motor Vehicle Incidents.
   a. OSHA does not require reporting injuries including motor vehicles that occur on public roads or highways, unless the incident occurs in a construction work zone.
   b. Although employers who are required to keep records must record such vehicle incidents in their *OSHA-300 Log* of Work-Related Injuries and Illnesses, OSHA does not investigate such events. (See §1904.39(b)(3).)

   NOTE: 29 CFR Part 1904 has new requirements for reporting work-related fatalities, hospitalizations, amputations or losses of an eye. The new rule, which also updates the list of employers partially exempt from OSHA record-keeping requirements, went into effect on January 1, 2015, for workplaces under federal OSHA jurisdiction. (See 79 FR 56129, Occupational Injury and Illness Recording and Reporting Requirements – NAICS Update and Reporting Revisions, September 18, 2014.)

III. Rescue Operations and Emergency Response.

A. OSHA's Authority to Direct Rescue Operations.

1. Direction of Rescue Operations.
   OSHA has no authority to direct rescue operations. These are the responsibility of the employer and/or local political subdivisions or state agencies.
2. Monitoring and Inspecting Working Conditions of Rescue Operations.
   OSHA may monitor and inspect working conditions of covered employees engaged in rescue operations to ensure compliance with standards that protect rescuers, and to provide technical assistance where appropriate.

B. Voluntary Rescue Operations Performed by Employees.

OSHA recognizes that an employee may choose to place himself/herself at risk to save the life of another person. The following provides guidance on OSHA citation policy toward employers whose employees perform, or attempt to perform, rescues of individuals in life-threatening danger.

1. Imminent Danger.
   §1903.14(f) provides that no citation may be issued to an employer because of a rescue activity undertaken by an employee of that employer when an individual is in imminent danger [i.e., the existence of any condition or practice that could reasonably be expected to cause death or serious physical harm before such condition or practice can be abated] unless:
   a. Such employee is designated or assigned by the employer to have responsibility to perform or assist in rescue operations,

   AND

the employer fails to provide protection of the safety and health of such employee, including failing to provide appropriate training and rescue equipment; or

   b. Such employee is directed by the employer to perform rescue activities in the course of carrying out the employee's job duties,

      AND

      the employer fails to provide protection of the safety and health of such employee, including failing to provide appropriate training and rescue equipment; or

   c. Such employee is employed in a workplace that requires the employee to carry out duties that are directly related to a workplace operation where the likelihood of life-threatening events is foreseeable, such as operations where employees are located in confined spaces or trenches, handle hazardous waste, respond to emergency situations, perform excavations, or perform construction over water;

      AND

      such employee has not been designated or assigned to perform or assist in rescue operations and voluntarily elects to rescue such an individual;

      AND

      the employer has failed to instruct employees not designated or assigned to perform or assist in rescue operations of the arrangements for rescue, not to attempt rescue, and of the hazards of attempting rescue without adequate training or equipment.

2. Citation for Voluntary Actions.
   If an employer has trained his or her employees in accordance with §1903.14, no citation will be issued for an employee's voluntary rescue actions, regardless of whether they are successful.

C. Emergency Response.

1. Role in Emergency Operations.
   While it is OSHA's policy to respond as quickly as possible to significant events that may affect the health or safety of employees, the agency does not have authority to direct emergency operations.
2. Response to Catastrophic Events (Note: these are *not* OSH Act requirements).
   OSHA responds to catastrophic events promptly and acts as an active and forceful protector of employee safety and health during the response, cleanup, removal, storage, and investigation phases of these incidents, while maintaining a visible but limited role during the initial response phase.
3. OSHA's Role.
   a. For inspections of an ongoing emergency response or post-emergency response operation where there has been a catastrophic event, or where OSHA is acting under the National Emergency Management Plan (NEMP), Regional Administrators will determine the overall role that OSHA will play. See CPL 02-02-073, *Inspection Procedures for 29 CFR 1910.120 and 1926.65, Paragraph (q): Emergency Response to Hazardous Substance Releases*, dated August 27, 2007.
   b. During an event that is covered by the NEMP, OSHA has a responsibility and authority to both enforce its regulations and provide technical advice and assistance to the federal on-scene coordinator. If such an event occurs in a State

Plan State, OSHA will coordinate with the State Plan agency to ensure agency's involvement in the response.

c. For details on OSHA's response to occupationally-related incidents involving multiple fatalities, extensive injuries, massive toxic exposures, extensive property damage, or potential worker injury that generates widespread media interest. See CPL 02-00-094, *OSHA Response to Significant Events of Potentially Catastrophic Consequences*, dated July 22, 1991.

4. Incidents of National Significance.

For detailed instructions on how to proceed during incidents of national significance when OSHA has been designated as the primary federal agency for the coordination of technical assistance and consultation for emergency response and recovery worker health and safety, and the Assistant Secretary has activated the National Emergency Response Plan, see HSO 01-00-001 *National Emergency Management Plan*, dated December 18, 2003, and the National Response Framework (Worker Safety and Health Support Annex).

NOTE: These documents apply when activated.

OSHA® FactSheet

Updates to OSHA's Recordkeeping Rule: Reporting Fatalities and Severe Injuries

OSHA's updated recordkeeping rule expands the list of severe injuries that all employers must report to OSHA. Establishments located in states under Federal OSHA jurisdiction must begin to comply with the new requirements on January 1, 2015. Establishments located in states that operate their own safety and health programs should check with their state plan for the implementation date of the new requirements.

What am I required to report under the new rule?

Previously, employers had to report the following to OSHA:

- All work-related fatalities
- Work-related hospitalizations of three or more employees

Starting in 2015, employers will have to report the following to OSHA:

- All work-related fatalities
- All work-related inpatient hospitalizations of one or more employees
- All work-related amputations
- All work-related losses of an eye

Who is covered under the new rule?

All employers under OSHA jurisdiction must report all work-related fatalities, hospitalizations, amputations and losses of an eye to OSHA, even employers who are exempt from routinely keeping OSHA injury and illness records due to company size or industry.

An amputation is defined as the traumatic loss of a limb or other external body part. Amputations include a part, such as a limb or appendage, that has been severed, cut off, amputated (either completely or partially); fingertip amputations with or without bone loss; medical amputations resulting from irreparable damage; and amputations of body parts that have since been reattached.

How soon must I report a fatality or severe injury or illness?

Employers must report work-related fatalities within **8 hours of finding out about them.**

Employers only have to report fatalities that occurred within 30 days of a work-related incident.

For any inpatient hospitalization, amputation, or eye loss **employers must report the incident within 24 hours of learning about it.** Employers only have to report an inpatient hospitalization, amputation or loss of an eye that occurs within 24 hours of a work-related incident.

How do I report an event to OSHA?

Employers have three options for reporting the event:

- By telephone to the nearest OSHA Area Office during normal business hours.
- By telephone to the 24-hour OSHA hotline at 1-800-321-OSHA (6742).
- OSHA is developing a new means of reporting events electronically, which will be available soon at www.osha.gov.

What information do I need to report?

For any fatality that occurs within 30 days of a work-related incident, employers must report the event **within 8 hours** of finding out about it.

For any inpatient hospitalization, amputation, or eye loss that occurs within 24 hours of a work-related incident, employers must report the event within 24 hours of learning about it.

Employers reporting a fatality, inpatient hospitalization, amputation or loss of an eye to OSHA must report the following information:

- Establishment name
- Location of the work-related incident
- Time of the work-related incident
- Type of reportable event (i.e., fatality, inpatient hospitalization, amputation or loss of an eye)
- Number of employees who suffered the event
- Names of the employees who suffered the event
- Contact person and his or her phone number
- Brief description of the work-related incident

Employers do not have to report an event if it:

- Resulted from a motor vehicle accident on a public street or highway. Employers must report the event if it happened in a construction work zone.
- Occurred on a commercial or public transportation system (airplane, subway, bus, ferry, streetcar, light rail, train).
- Occurred more than 30 days after the work-related incident in the case of a fatality or more than 24 hours after the work-related incident in the case of an inpatient hospitalization, amputation, or loss of an eye.

Employers do not have to report an inpatient hospitalization if it was for diagnostic testing or observation only. An inpatient hospitalization is defined as a formal admission to the inpatient service of a hospital or clinic for care or treatment.

Employers do have to report an inpatient hospitalization due to a heart attack, if the heart attack resulted from a work-related incident.

Where can I find more information?

For more information about the updated reporting requirements, visit OSHA's webpage on the revised recordkeeping rule at www.osha.gov/recordkeeping2014.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

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U.S. Department of Labor

DEA FS-3745 09/2014

U.S. Department of Labor

Occupational Safety and Health

Un-Programmed Activity

Reporting ID		Previous Activity(Type & Number)		Referral Number		
Establishment Information	Establishment Name			Employer ID		
	Site Address			City Code		County Code
		Site Phone		Site Fax		
	Mailing Address					
	Event Address					
Industry & Ownership	Type of Business			Primary SIC		No. of Employees
	Ownership					
Receipt Information	Reported By		Date		Time	
	Job Title		Telephone			
Employee Representation	Group Name(s):					
Classification						
Event Description	Event Date	Event Time	Number of Fatalities	Number of Hospitalized	Number of Non-Hospitalized Injuries	Number of Unaccounted for
	Type of Event					
Preliminary Description						
Action	Inspection Planned	Supervisor(s) Assignment		CSHO(s) Assigned		
Strategic Initiatives						
National Emphasis						
Local Emphasis						
Optional Information	Type	ID	Optional Information Value			
Comments						

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ABOUT OSHA WORKERS EMPLOYERS REGULATIONS ENFORCEMENT TOPICS NEWS DATA TRAINING

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Part Number:	1926
Part Title:	Safety and Health Regulations for Construction
Subpart:	CC
Subpart Title:	Cranes & Derricks in Construction
Standard Number:	1926.1403
Title:	Assembly/Disassembly--selection of manufacturer or employer procedures.
GPO Source:	e-CFR

When assembling or disassembling equipment (or attachments), the employer must comply with all applicable manufacturer prohibitions and must comply with either:

1926.1403(a)

Manufacturer procedures applicable to assembly and disassembly, or

1926.1403(b)

Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in § 1926.1406. **Note:** The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. (*See* § 1926.1404(r).)

[75 FR 48140, August 9, 2010]

Next Standard (1926.1404)

Regulations (Standards - 29 CFR) - Table of Contents

UNITED STATES
DEPARTMENT OF LABOR

Occupational Safety and Health Administration
200 Constitution Ave., NW,
Washington, DC 20210
800-321-6742 (OSHA)
TTY
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OCCUPATIONAL SAFETY AND HEALTH

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Accessibility Statement

Part Number:	1926
Part Title:	Safety and Health Regulations for Construction
Subpart:	CC
Subpart Title:	Cranes & Derricks in Construction
Standard Number:	1926.1404
Title:	Assembly/Disassembly--general requirements (applies to all assembly and disassembly operations).
GPO Source:	e-CFR

1926.1404(a)

Supervision--competent-qualified person.

1926.1404(a)(1)

Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons ("A/D director").

1926.1404(a)(2)

Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.

1926.1404(b)

Knowledge of procedures. The A/D director must understand the applicable assembly/disassembly procedures.

1926.1404(c)

Review of procedures. The A/D director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).

926.1404(d)

Crew instructions.

926.1404(d)(1)

Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all of the following:

926.1404(d)(1)(i)

Their tasks.

926.1404(d)(1)(ii)

The hazards associated with their tasks.

926.1404(d)(1)(iii)

The hazardous positions/locations that they need to avoid.

926.1404(d)(2)

During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in paragraphs (d)(1)(i) through (d)(1)(iii) of this section must be met.

26.1404(e)(1)

Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location.

26.1404(e)(2)

Where the operator knows that a crew member went to a location covered by paragraph (e)(1) of this section, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a pre-arranged system of communication that the crew member is in a safe position.

26.1404(f)

Working under the boom, jib or other components.

26.1404(f)(1)

When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of paragraph (f)(2) of this section are met.

26.1404(f)(2)

Exception. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See Non-mandatory Appendix B of this subpart for an example.)

26.1404(g)

Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, must not be exceeded for the equipment being assembled/disassembled.

26.1404(h)

Addressing specific hazards. The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include:

26.1404(h)(1)

Site and ground bearing conditions. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (*see* § 1926.1402 for ground condition requirements).

26.1404(h)(2)

Blocking material. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability.

26.1404(h)(3)

Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to:

16.1404(h)(3)(i)

Protect the structural integrity of the equipment, and

26.1404(h)(3)(ii)

✱ Prevent dangerous movement and collapse.

6.1404(h)(4)

Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with § 1926.1417(o)(3) before assembly/disassembly begins.

6.1404(h)(5)

Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components.

6.1404(h)(6)

Center of gravity.

5.1404(h)(6)(i)

The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability.

6.1404(h)(6)(ii)

1926.1404(h)(7)

Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components must be rigged or supported to maintain stability upon the removal of the pins.

1926.1404(h)(8)

Snagging. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).

1926.1404(h)(9)

Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.

1926.1404(h)(10)

Boom hoist brake failure. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake must be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure must be used.

1926.1404(h)(11)

Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.

1926.1404(h)(12)

Wind speed and weather. The effect of wind speed and weather on the equipment.

1926.1404(i)

[*Reserved.*]

1926.1404(j)

Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which must not be exceeded.

1926.1404(k)

Weight of components. The weight of each of the components must be readily available.

1926.1404(l)

[*Reserved.*]

1926.1404(m)

Components and configuration.

1926.1404(m)(1)

The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment must be in accordance with:

1926.1404(m)(1)(i)

Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or

1926.1404(m)(1)(ii)

Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications).

1926.1404(m)(2)

Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (m)(1) of this section (*see* § 1926.1412(c) for post-assembly inspection requirements).

1926.1404(n)

[*Reserved.*]

1926.1404(o)

Shipping pins. Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.

1926.1404(q)

Outriggers and Stabilizers. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements must be met (except as otherwise indicated):

1926.1404(q)(1)

The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.

1926.1404(q)(2)

The outriggers must be set to remove the equipment weight from the wheels, except for locomotive cranes (*see* paragraph (q)(6) of this section for use of outriggers on locomotive cranes). This provision does not apply to stabilizers.

1926.1404(q)(3)

When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers.

1926.1404(q)(4)

Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.

1926.1404(q)(5)

Outrigger and stabilizer blocking must:

1926.1404(q)(5)(i)

Meet the requirements in paragraphs (h)(2) and (h)(3) of this section.

1926.1404(q)(5)(ii)

Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam.

1926.1404(q)(6)

For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures must be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures must be met regarding truck wedges or screws.

1926.1404(r)

Rigging. In addition to following the requirements in 29 CFR 1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that:

1926.1404(r)(1)

The rigging work is done by a qualified rigger.

1926.1404(r)(2)

Synthetic slings are protected from: Abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. **Note:** Requirements for the protection of wire rope slings are contained in 29 CFR 1926.251(c)(9).

1926.1404(r)(3)

When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.

[75 FR 48140, August 9, 2010]

Next Standard (1926.1405)

Regulations (Standards - 29 CFR) - Table of Contents

UNITED STATES
DEPARTMENT OF LABOR

Part Number:	1926
Part Title:	Safety and Health Regulations for Construction
Subpart:	CC
Subpart Title:	Cranes & Derricks in Construction
Standard Number:	1926.1405
Title:	Disassembly--additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures).
GPO Source:	e-CFR

Dismantling (including dismantling for changing the length of) booms and jibs.

1926.1405(a)

None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.

1926.1405(b)

None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension.

1926.1405(c)

None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support).

1926.1405(d)

None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.

[75 FR 48141, August 9, 2010]

Next Standard (1926.1406)

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DEPARTMENT OF LABOR

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art Number:	1926
art Title:	Safety and Health Regulations for Construction
ubpart:	CC
ubpart Title:	Cranes & Derricks in Construction
tandard Number:	1926.1406
itle:	Assembly/Disassembly--employer procedures--general requirements.
PO Source:	e-CFR

6.1406(a)

When using employer procedures instead of manufacturer procedures for assembly/disassembly, the employer must ensure that the procedures:

26.1406(a)(1)

Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment.

26.1406(a)(2)

Provide adequate support and stability of all parts of the equipment.

26.1406(a)(3)

Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized.

26.1406(b)

Qualified person. Employer procedures must be developed by a qualified person.

[75 FR 48142, August 9, 2010]

Next Standard (1926.1407)

Regulations (Standards - 29 CFR) - Table of Contents

UNITED STATES
DEPARTMENT OF LABOR

ccupational Safety and Health Administration
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EDERAL GOVERNMENT OCCUPATIONAL SAFETY AND HEALTH ABOUT THE SITE

- **Part Number:** 1926
- **Part Title:** Safety and Health Regulations for Construction
- **Subpart:** CC
- **Subpart Title:** Cranes & Derricks in Construction
- **Standard Number:** 1926.1435
- **Title:** Tower cranes.
- **GPO Source:** e-CFR

1926.1435(a)

This section contains supplemental requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise.

1926.1435(b)

Erecting, climbing and dismantling.

1926.1435(b)(1)

Section 1926.1403 (Assembly/Disassembly--selection of manufacturer or employer procedures), § 1926.1404 (Assembly/Disassembly--general requirements (applies to all assembly and disassembly operations)), § 1926.1405 (Disassembly--additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)), and § 1926.1406 (Assembly/Disassembly--employer procedures--general requirements), apply to tower cranes (except as otherwise specified), except that the term "assembly/disassembly" is replaced by "erecting, climbing and dismantling," and the term "disassembly" is replaced by "dismantling."

1926.1435(b)(2)

Dangerous areas (self-erecting tower cranes). In addition to the requirements in § 1926.1404(e), for self-erecting tower cranes, the following applies: Employees must not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.

1926.1435(b)(3)

Foundations and structural supports. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) must be designed by the manufacturer or a registered professional engineer.

1926.1435(b)(4)

Addressing specific hazards. The requirements in § 1926.1404(h)(1) through (9) apply. In addition, the A/D director must address the following:

1926.1435(b)(4)(i)

Foundations and structural supports. The A/D director must determine that tower crane foundations and structural supports are installed in accordance with their design.

1926.1435(b)(4)(ii)

Loss of backward stability. Backward stability before swinging self erecting cranes or cranes on traveling or static undercarriages.

1926.1435(b)(4)(iii)

Wind speed. Wind must not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.

1926.1435(b)(5)

umb tolerance, the crane [illegible]

6.1435(b)(6)

Multiple tower crane jobsites. On jobsites where more than one fixed jib (hammerhead) tower crane is installed, the cranes must be located such that no crane can come in contact with the structure of another crane. Cranes are permitted to pass over one another.

6.1435(b)(7)

Climbing procedures. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer must:

6.1435(b)(7)(i)

✱ Comply with all manufacturer prohibitions.

6.1435(b)(7)(ii)

Have a registered professional engineer verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors.

6.1435(b)(8)

Counterweight/ballast.

26.1435(b)(8)(i)

Equipment must not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a registered professional engineer familiar with the equipment.

26.1435(b)(8)(ii)

The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment must not be exceeded.

26.1435(c)

Signs. The size and location of signs installed on tower cranes must be in accordance with manufacturer specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve in writing the size and location of any signs.

26.1435(d)

Safety devices.

26.1435(d)(1)

Section 1926.1415 does not apply to tower cranes.

26.1435(d)(2)

The following safety devices are required on all tower cranes unless otherwise specified:

26.1435(d)(2)(i)

Boom stops on luffing boom type tower cranes.

26.1435(d)(2)(ii)

Jib stops on luffing boom type tower cranes if equipped with a jib attachment.

26.1435(d)(2)(iii)

Travel rail end stops at both ends of travel rail.

26.1435(d)(2)(iv)

Travel rail clamps on all travel bogies.

26.1435(d)(2)(v)

Integrally mounted check valves on all load supporting hydraulic cylinders.

26.1435(d)(2)(vi)

Hydraulic system pressure limiting device.

26.1435(d)(2)(vii)

The following brakes, which must automatically set in the event of pressure loss or power failure, are required:

1926.1435(d)(2)(vii)(B)

Swing brake.

1926.1435(d)(2)(vii)(C)

Trolley brake.

1926.1435(d)(2)(vii)(D)

Rail travel brake.

1926.1435(d)(2)(viii)

Deadman control or forced neutral return control (hand) levers.

1926.1435(d)(2)(ix)

Emergency stop switch at the operator's station.

1926.1435(d)(2)(x)

Trolley end stops must be provided at both ends of travel of the trolley.

1926.1435(d)(3)

Proper operation required. Operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. The equipment must be taken out of service, and operations must not resume until the device is again working properly. *See* § 1926.1417(f). Alternative measures are not permitted to be used.

1926.1435(e)

Operational aids.

1926.1435(e)(1)

Section 1926.1416 does not apply to tower cranes.

1926.1435(e)(2)

The devices listed in this section ("operational aids") are required on all tower cranes covered by this subpart, unless otherwise specified.

1926.1435(e)(3)

Operations must not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, must be followed. *See* § 1926.1417(j) for additional requirements.

1926.1435(e)(4)

If an operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under § 1926.1434.

1926.1435(e)(5)

Category I operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. *Exception:* If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts.

1926.1435(e)(5)(i)

Trolley travel limiting device. The travel of the trolley must be restricted at both ends of the jib by a trolley travel limiting device to prevent the trolley from running into the trolley end stops. *Temporary alternative measures:*

1926.1435(e)(5)(i)(A)

Option A. The trolley rope must be marked (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops.

1926.1435(e)(5)(i)(B)

Option B. A spotter who is in direct communication with the operator must be used when operations are conducted within 10 feet of the outer or inner trolley end stops.

1926.1435(e)(5)(ii)

adius, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.

6.1435(e)(5)(iii)

Anti two-blocking device. The tower crane must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. *Temporary alternative measures:* Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.

6.1435(e)(5)(iv)

Hoist drum lower limiting device. Tower cranes manufactured after November 8, 2011 must be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum. *Temporary alternative measures:* Mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last 2 wraps of hoist cable being spooled off the drum, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached

6.1435(e)(5)(v)

Load moment limiting device. The tower crane must have a device that prevents moment overloading. *Temporary alternative measures:* A radius indicating device must be used (if the tower crane is not equipped with a radius indicating device, the radius must be measured to ensure the load is within the rated capacity of the crane). In addition, the weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.

6.1435(e)(5)(vi)

Hoist line pull limiting device. The capacity of the hoist must be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. *Temporary alternative measures:* The operator must ensure that the weight of the load does not exceed the capacity of the hoist (including for each individual gear ratio if equipped with a multiple speed hoist transmission).

6.1435(e)(5)(vii)

Rail travel limiting device. The travel distance in each direction must be limited to prevent the travel bogies from running into the end stops or buffers. *Temporary alternative measures:* A spotter who is in direct communication with the operator must be used when operations are conducted within 10 feet of either end of the travel rail end stops; the spotter must inform the operator of the distance of the travel bogies from the end stops or buffers.

26.1435(e)(5)(viii)

Boom hoist drum positive locking device and control. The boom hoist drum must be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. *Temporary alternative measures:* The device must be manually set when required if an electric, hydraulic or automatic control is not functioning.

26.1435(e)(6)

Category II operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. *Exception:* If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts.

26.1435(e)(6)(i)

Boom angle or hook radius indicator.

26.1435(e)(6)(i)(A)

Luffing boom tower cranes must have a boom angle indicator readable from the operator's station.

26.1435(e)(6)(i)(B)

Hammerhead tower cranes manufactured after November 8, 2011 must have a hook radius indicator readable from the operator's station.

26.1435(e)(6)(i)(C)

Temporary alternative measures: Hook radii or boom angle must be determined by measuring the hook radii or boom angle with a measuring device.

26.1435(e)(6)(ii)

Trolley travel deceleration device. The trolley speed must be automatically reduced prior to the trolley reaching the end limit in both directions. *Temporary alternative measure:* The employer must post a notice in the cab of the crane notifying the operator that the trolley travel deceleration device is malfunctioning and instructing the operator to take special care to reduce the trolley speed when approaching the trolley end limits.

26.1435(e)(6)(iii)

malfunctioning and instructing the operator to take special care to reduce the boom speed when approaching the minimum or maximum radius limits.

1926.1435(e)(6)(iv)

Load hoist deceleration device. The load speed must be automatically reduced prior to the hoist reaching the upper limit. *Temporary alternative measure:* The employer must post a notice in the cab of the crane notifying the operator that the load hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the load speed when approaching the upper limits.

1926.1435(e)(6)(v)

Wind speed indicator. A device must be provided to display the wind speed and must be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it must be mounted at or above the jib level. *Temporary alternative measures:* Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed.

1926.1435(e)(6)(vi)

Load indicating device. Cranes manufactured after November 8, 2011 must have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. *Temporary alternative measures:* The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.

1926.1435(f)

Inspections.

1926.1435(f)(1)

Section 1926.1412 (Inspections) applies to tower cranes, except that the term "assembly" is replaced by "erection." Section 1926.1413 (Wire rope--inspection) applies to tower cranes.

1926.1435(f)(2) *

Pre-erection inspection. Before each crane component is erected, it must be inspected by a qualified person for damage or excessive wear.

1926.1435(f)(2)(i)

The qualified person must pay particular attention to components that will be difficult to inspect thoroughly during shift inspections.

1926.1435(f)(2)(ii)

If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, that component must not be erected on the crane unless it is repaired and, upon reinspection by the qualified person, found to no longer create a safety hazard.

1926.1435(f)(2)(iii)

If the qualified person determines that, though not presently a safety hazard, the component needs to be monitored, the employer must ensure that the component is checked in the monthly inspections. Any such determination must be documented, and the documentation must be available to any individual who conducts a monthly inspection.

1926.1435(f)(3)

Post-erection inspection. In addition to the requirements in § 1926.1412(c), the following requirements must be met:

1926.1435(f)(3)(i)

A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, must be conducted after each erection.

1926.1435(f)(3)(ii)

The load test must be conducted in accordance with the manufacturer's instructions when available. Where these instructions are unavailable, the test must be conducted in accordance with written load test procedures developed by a registered professional engineer familiar with the type of equipment involved.

1926.1435(f)(4)

Monthly. The following additional items must be included:

1926.1435(f)(4)(i)

Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support.

1926.1435(f)(4)(ii)

The upper-most tie-in, braces, floor supports and floor wedges where the tower crane is supported by the structure, for loose or dislodged components.